

# *Anand's Atlas of Histology*



***Major.Dr.A.Anand***

# ANAND'S ATLAS OF HISTOLOGY

WEB VERSION – 1.0

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ANAND'S ATLAS OF HISTOLOGY

THIS ATLAS WILL SERVE AS A RAPID REFERENCE  
HANDBOOK FOR UNDERGRADUATE MEDICAL  
STUDENTS AND POSTGRADUATES PRIOR TO  
EXAMS

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ANAND'S ATLAS OF HISTOLOGY



THIS BOOK IS DIVIDED INTO TWO SECTIONS  
EACH SECTION CONTAINS COLOUR PLATES  
EACH COLOUR PLATE CONTAINS PICTURES IN  
10X AND 40X VIEWS  
EACH COLOUR PLATE IS FOLLOWED BY A  
FEW IDENTIFICATION POINTS OF THE  
PICTURE



SECTION – 1 = GENERAL HISTOLOGY

SECTION – 2 = SYSTEMIC HISTOLOGY

ANAND'S ATLAS OF HISTOLOGY

# SECTION – 1

## GENERAL HISTOLOGY

ANAND'S ATLAS OF HISTOLOGY

# LIST OF COLOUR PLATES

SMOOTH MUSCLE

SKELETAL MUSCLE

CARDIAC MUSCLE

HYALINE CARTILAGE

WHITE FIBROCARILAGE

ELASTIC CARTILAGE

COMPACT BONE – LONGITUDINAL SECTION

COMPACT BONE – TRANSVERSE SECTION



# LIST OF COLOUR PLATES

LOOSE AREOLAR TISSUE

ADIPOSE TISSUE

THICK SKIN

THIN SKIN

PERIPHERAL NERVE – LONGITUDINAL SECTION

PERIPHERAL NERVE – TRANSVERSE SECTION

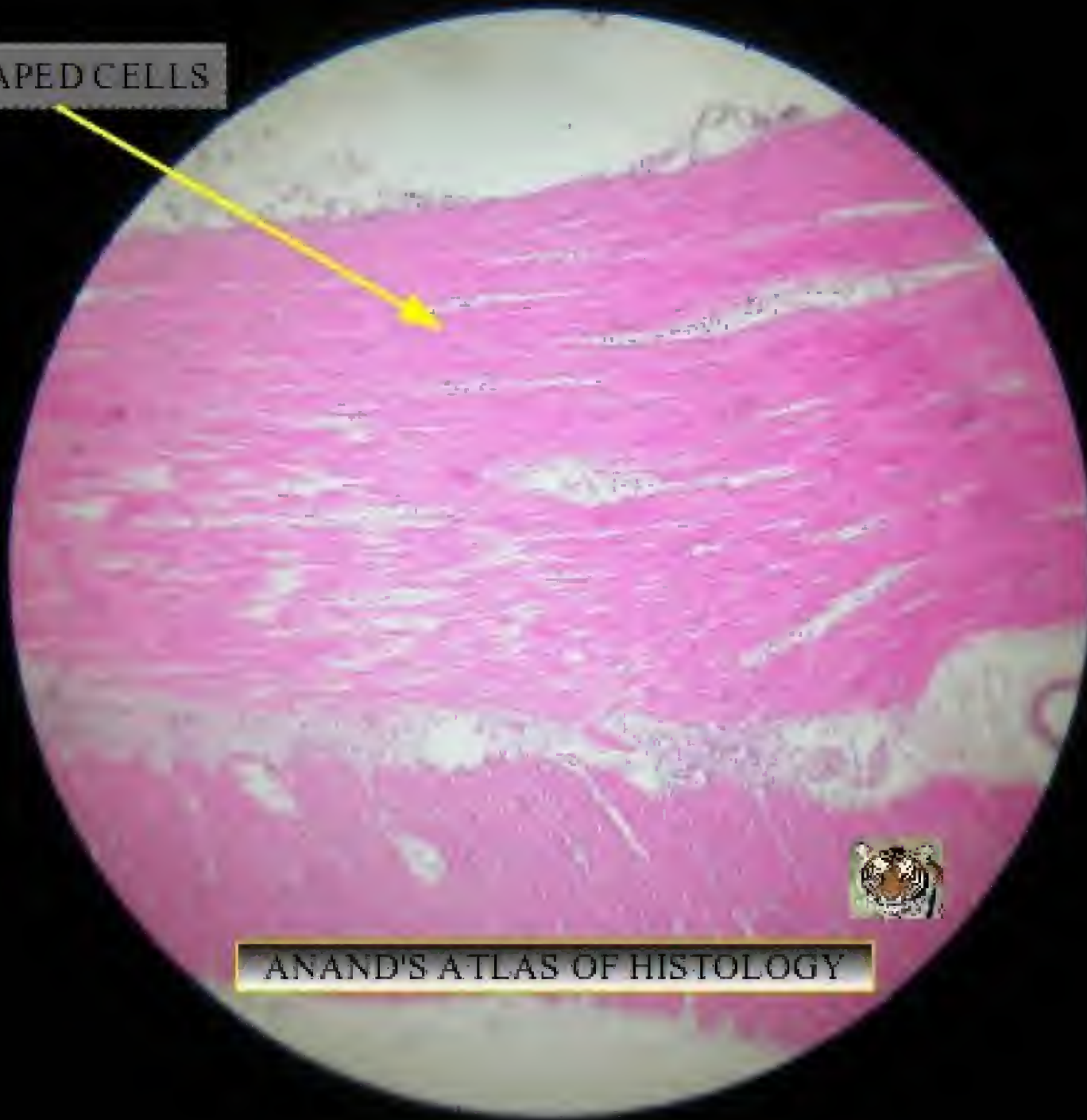
ELASTIC ARTERY

MUSCULAR ARTERY

LARGE VEIN

# SMOOTH MUSCLE

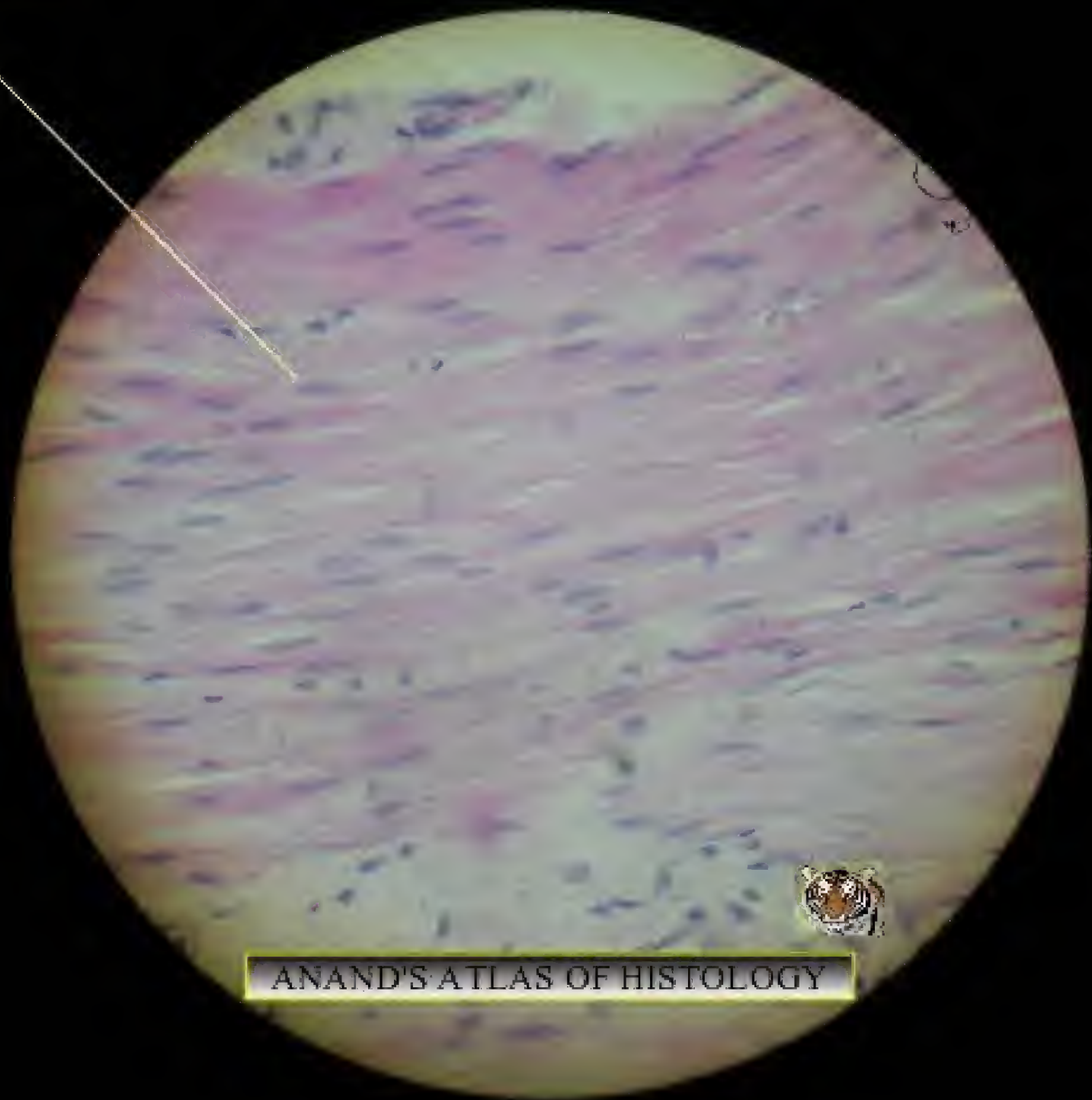
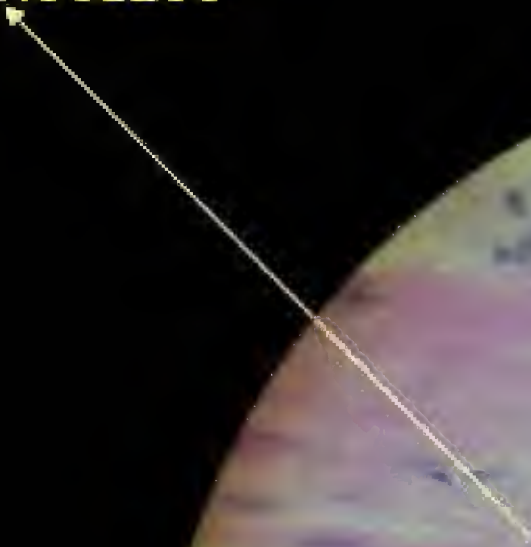
SPINDLE SHAPED CELLS



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CENTRAL NUCLEUS



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# SMOOTH MUSCLE

## POINTS FOR IDENTIFICATION

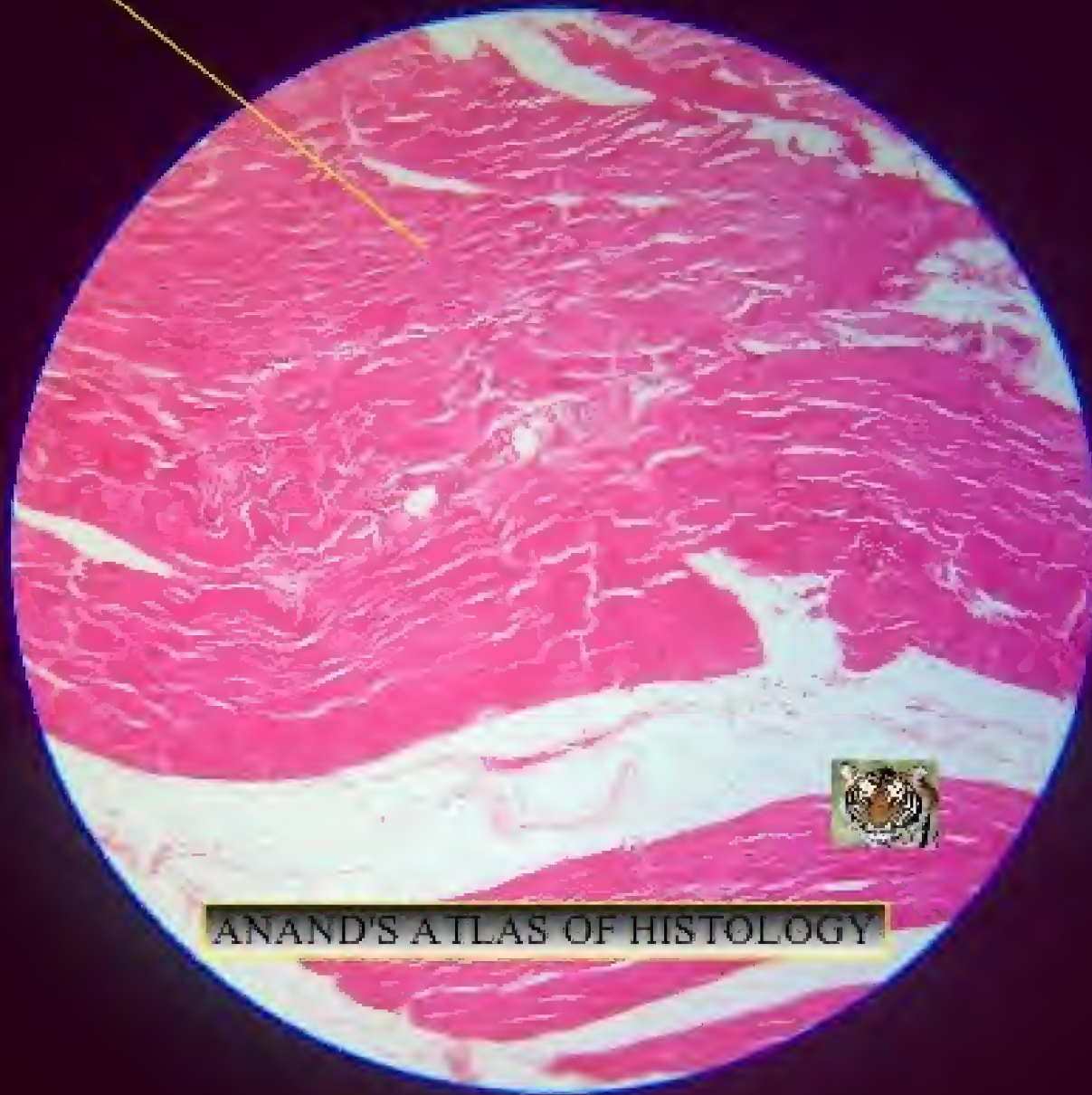
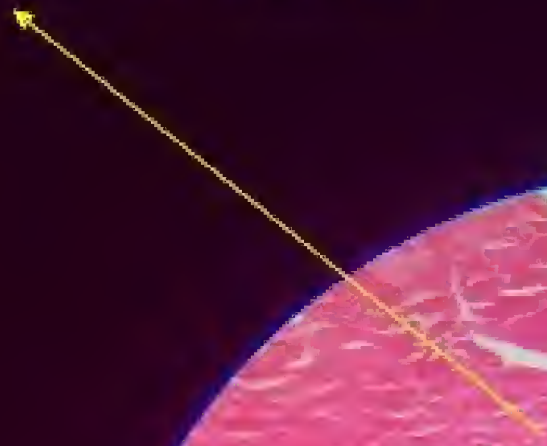
1. MYOCYTES ARE SPINDLE SHAPED
2. MYOCYTES CONTAIN CENTRAL NUCLEUS

# SKELETAL MUSCLE

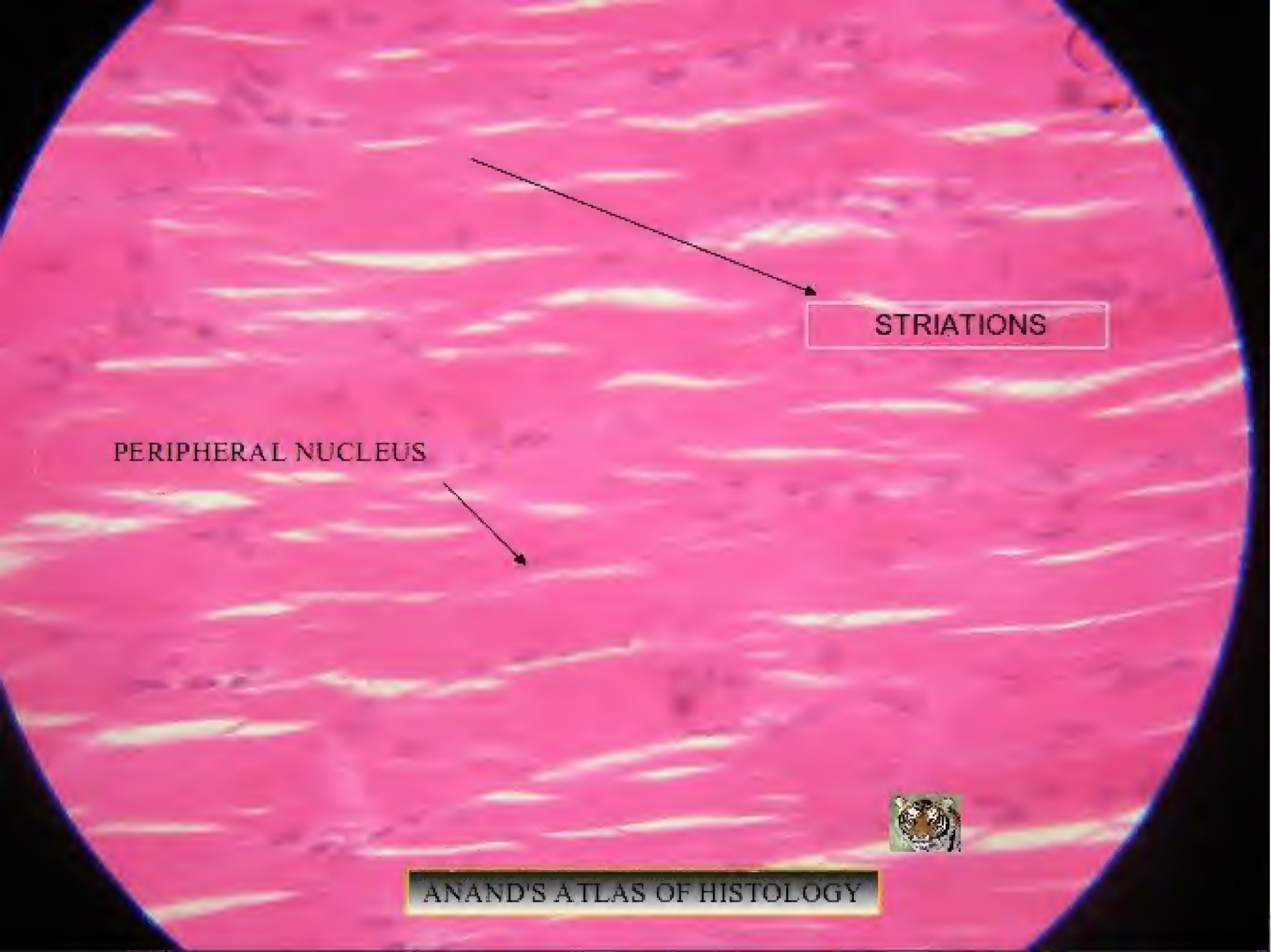
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MUSCLE FIBRES DO NOT BRANCH



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STRIATIONS

PERIPHERAL NUCLEUS



# SKELETAL MUSCLE

## POINTS FOR IDENTIFICATION

1. MUSCLE FIBRES DO NOT BRANCH

2. NUCLEUS IS LOCATED IN THE PERIPHERY

3. PRESENCE OF CROSS STRIATIONS



# CARDIAC MUSCLE



FIBRES ARE BRANCHING



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A light micrograph of skeletal muscle tissue stained with hematoxylin and eosin (H&E). The image shows multiple muscle fibers with prominent transverse striations. The fibers are arranged in parallel bundles. A black arrow points from a text label to a specific nucleus located centrally within one of the muscle fibers.

CENTRAL NUCLEUS



# CARDIAC MUSCLE

## POINTS FOR IDENTIFICATION

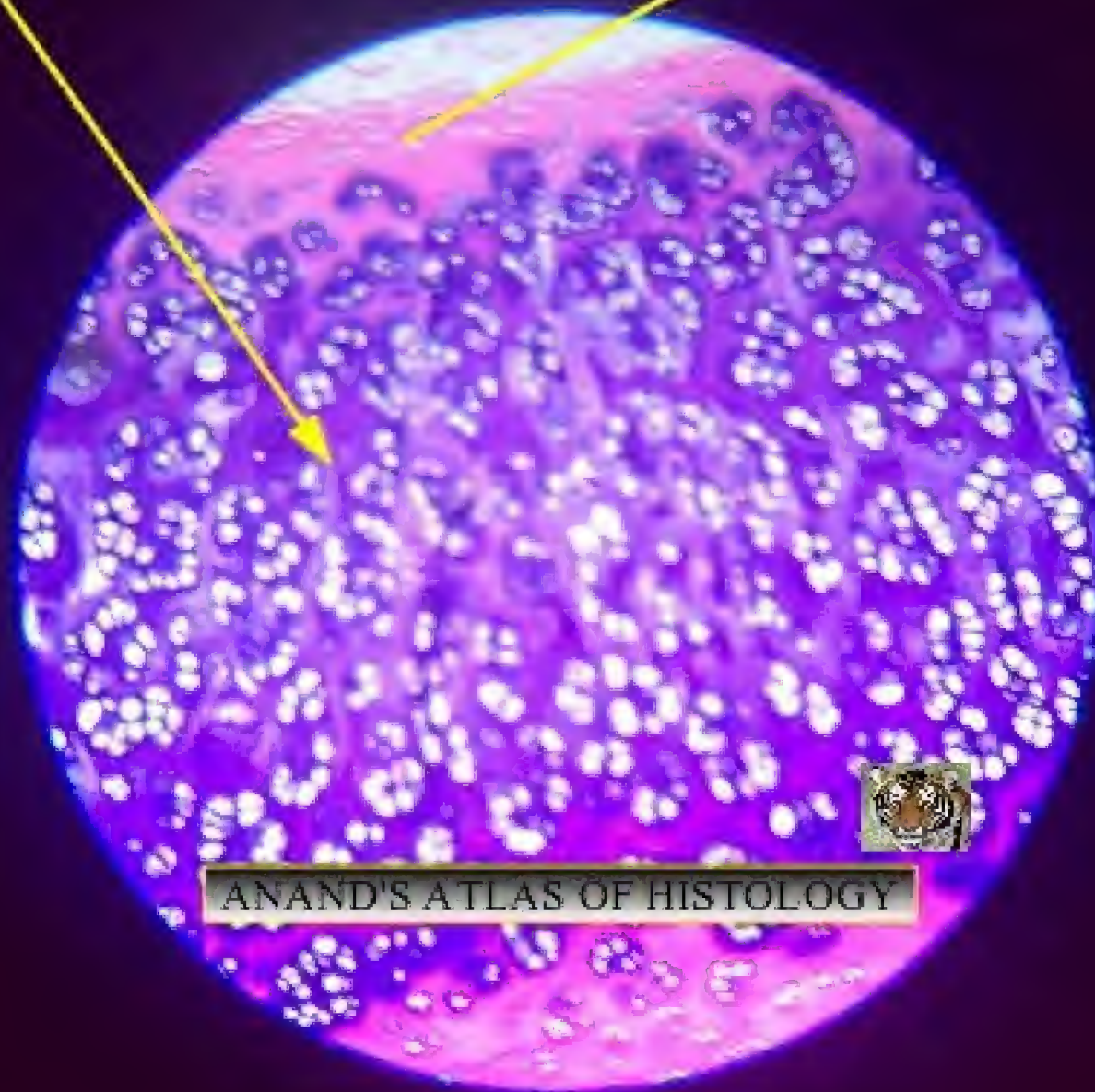
1. MUSCLE FIBRES ARE BRANCHING
2. NUCLEUS IS CENTRALLY PLACED
3. PRESENCE OF INTERCALATED DISC



# HYALINE CARTILAGE

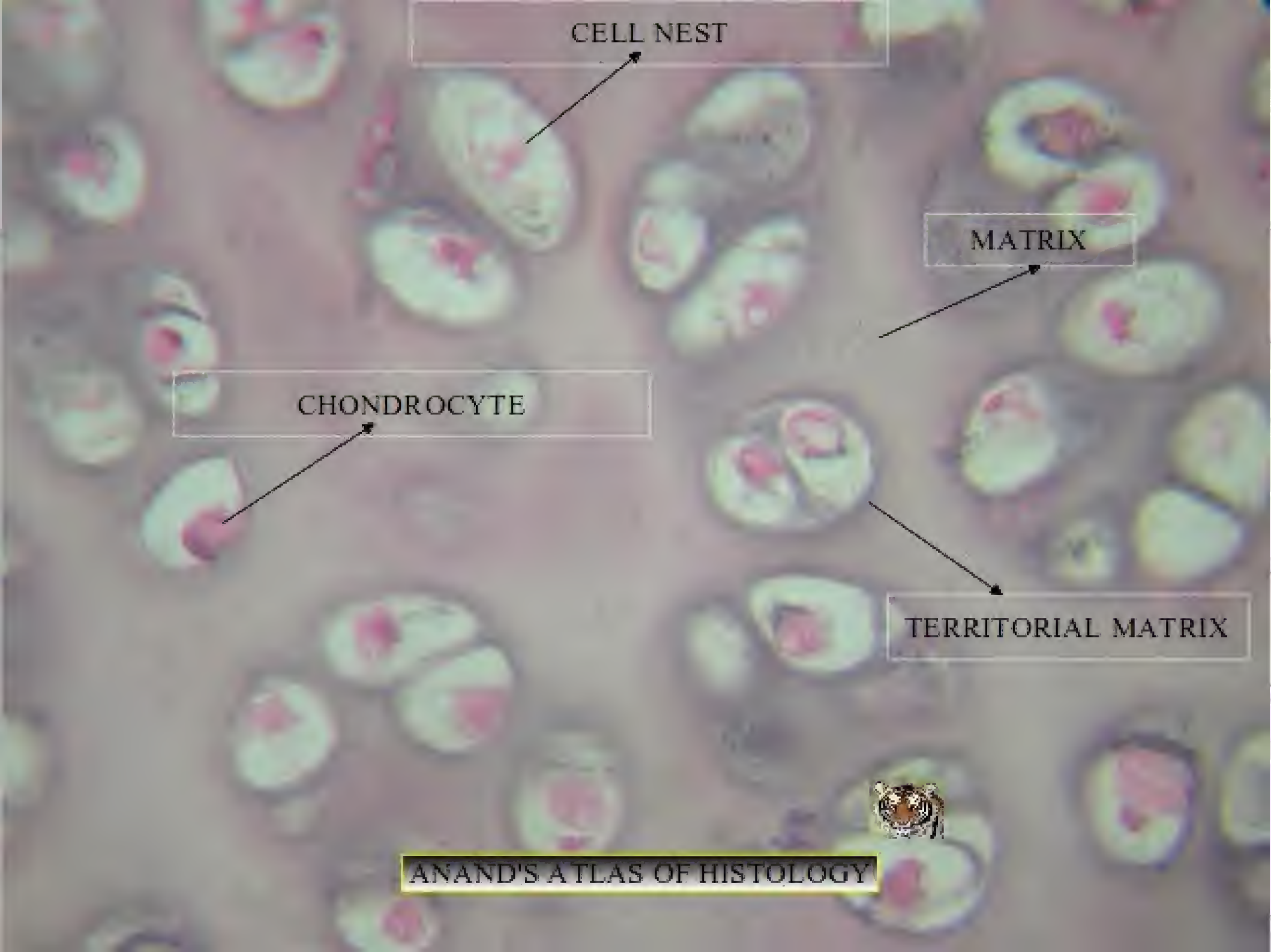
MATRIX

PERICHONDRIUM



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CELL NEST

MATRIX

CHONDROCYTE

TERRITORIAL MATRIX





# HYALINE CARTILAGE

## POINTS FOR IDENTIFICATION

1. PRESENCE OF PERICHONDRIUM
2. PRESENCE OF CELL NESTS
3. PRESENCE OF CHONDROCYTES IN CELL NESTS
4. MATRIX CONTAINS COLLAGEN FIBRES

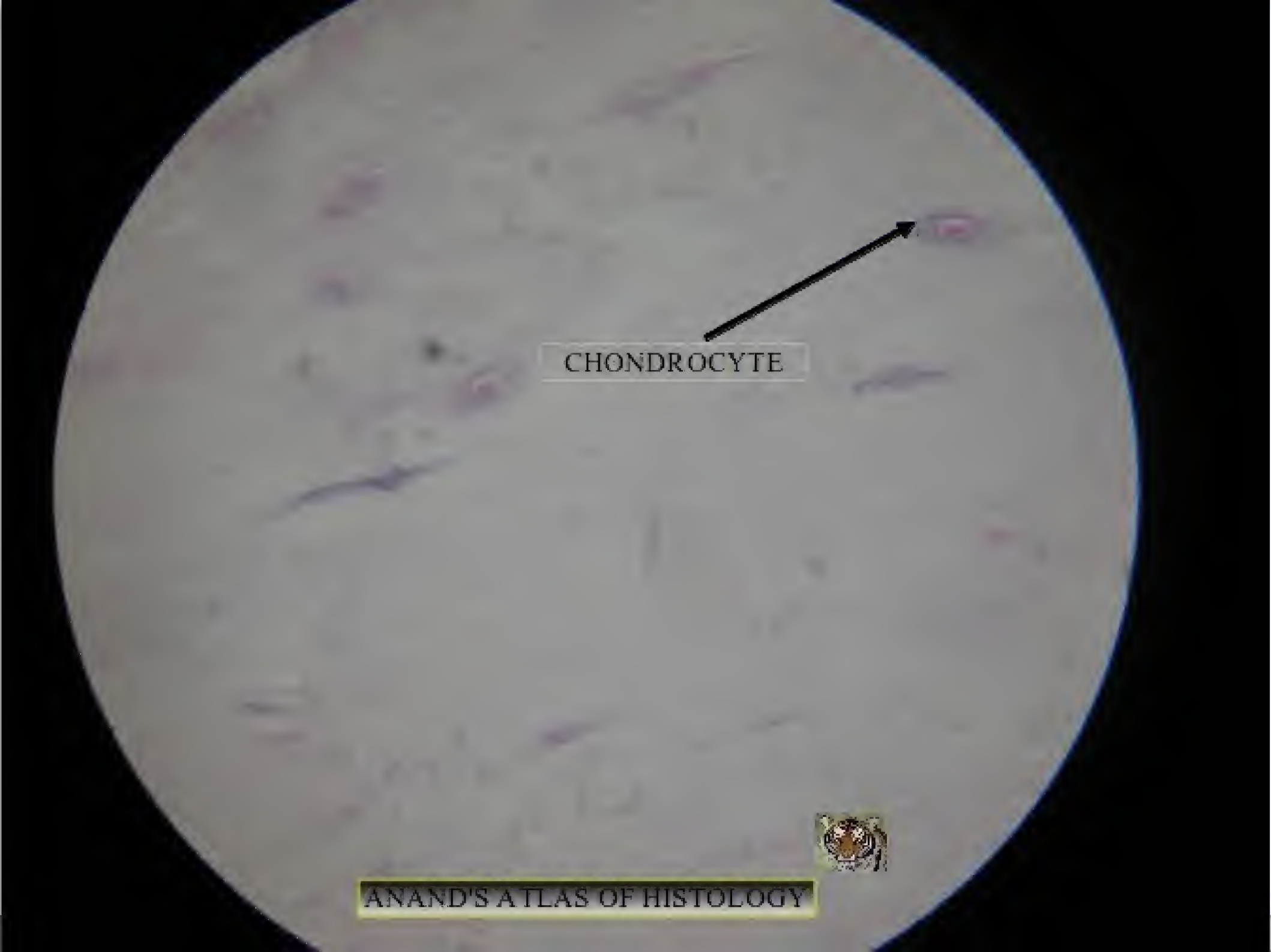


# WHITE FIBRO CARTILAGE

COLLAGEN FIBRES



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CHONDROCYTE

A circular microscopic field of view showing a dense population of small, rounded cells (chondrocytes) embedded in a light-colored, granular extracellular matrix. A black arrow points from the text label 'CHONDROCYTE' to a specific cell in the upper right quadrant. The cells have a distinct pinkish-purple nucleus and a lighter cytoplasm. The overall texture is slightly mottled due to the staining and the nature of the tissue.



# WHITE FIBRO CARTILAGE

## POINTS FOR IDENTIFICATION

1. ABSENCE OF PERICHONDRIUM
2. CHONDROCYTES ARE SEEN  
ARRANGED IN ROWS
3. MATRIX IS MADE OF COLLAGEN  
FIBRES



# ELASTIC CARTILAGE

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CHONDROCYTES IN LACUNAE



ANAND'S ATLAS OF HISTOLOGY

CHONDROCYTE IN LACUNAE

MATRIX

ELASTIC FIBRES

ANAND'S ATLAS OF HISTOLOGY





# ELASTIC CARTILAGE

## POINTS FOR IDENTIFICATION

1. CHONDROCYTES ARE PRESENT IN LACUNAE
2. MATRIX IS MADE OF ELASTIC FIBRES PREDOMINANTLY
3. PERICHONDRIUM IS PRESENT



# COMPACT BONE – LONGITUDINAL SECTION



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VOLKMAN'S CANAL

HAVERSIAN CANALS

OSTEONS



# COMPACT BONE - LONGITUDINAL SECTION

## POINTS FOR IDENTIFICATION

1. OSTEONS ARE SEEN ARRANGED IN  
COLUMNS

2. VOLKMAN'S CANALS CONNECT  
HAVERSIAN CANALS WITH THE PERIOSTEUM



# COMPACT BONE – TRANSVERSE SECTION

INTERSTITIAL LAMELLAE

CONCENTRIC LAMELLAE



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OSTEOCYTE

HAVERSIAN CANAL

CONCENTRIC LAMELLAE



ANAND'S ATLAS OF HISTOLOGY



# COMPACT BONE – TRANSVERSE SECTION

## POINTS FOR IDENTIFICATION

1. CONCENTRIC LAMELLAR ARRANGEMENT  
OF OSTEONS
2. INTERSTITIAL LAMELLAE IS SEEN
3. PRESENCE OF HAVERSIAN CANAL



# LOOSE AREOLAR TISSUE

COLLAGEN FIBRE



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COLLAGEN FIBRE

FIBROBLAST



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# LOOSE AREOLAR TISSUE

## POINTS FOR IDENTIFICATION

1. LOOSELY ARRANGED COLLAGEN FIBRES ARE SEEN
2. FIBROBLASTS ARE SEEN



# ADIPOSE TISSUE

ADIPOCYTE



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NUCLEUS IS PUSHED TO THE PERIPHERY

ADIPOCYTE

SIGNET RING APPEARANCE



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# ADIPOSE TISSUE

## POINTS FOR IDENTIFICATION

1. ADIPOCYTES ARE SEEN
2. NUCLEUS OF THE ADIPOCYTE IS PUSHED TO THE PERIPHERY
3. CYTOPLASM APPEARS AS A PINK RIM



# THICK SKIN

KERATIN LAYER

EPIDERMIS

DERMIS

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STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

EPIDERMAL PAPILLAE

DERMAL PAPILLAE



# THICK SKIN

## POINTS FOR IDENTIFICATION

1. LINED BY STRATIFIED SQUAMOUS EPITHELIUM
2. PRESENCE OF KERATIN LAYER
3. EPIDERMAL PROJECTIONS INTO DERMIS ARE EPIDERMAL PAPILLAE
4. DERMAL PROJECTIONS INTO EPIDERMIS ARE DERMAL PAPILLAE



# THIN SKIN

STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

HAIR FOLLICLE

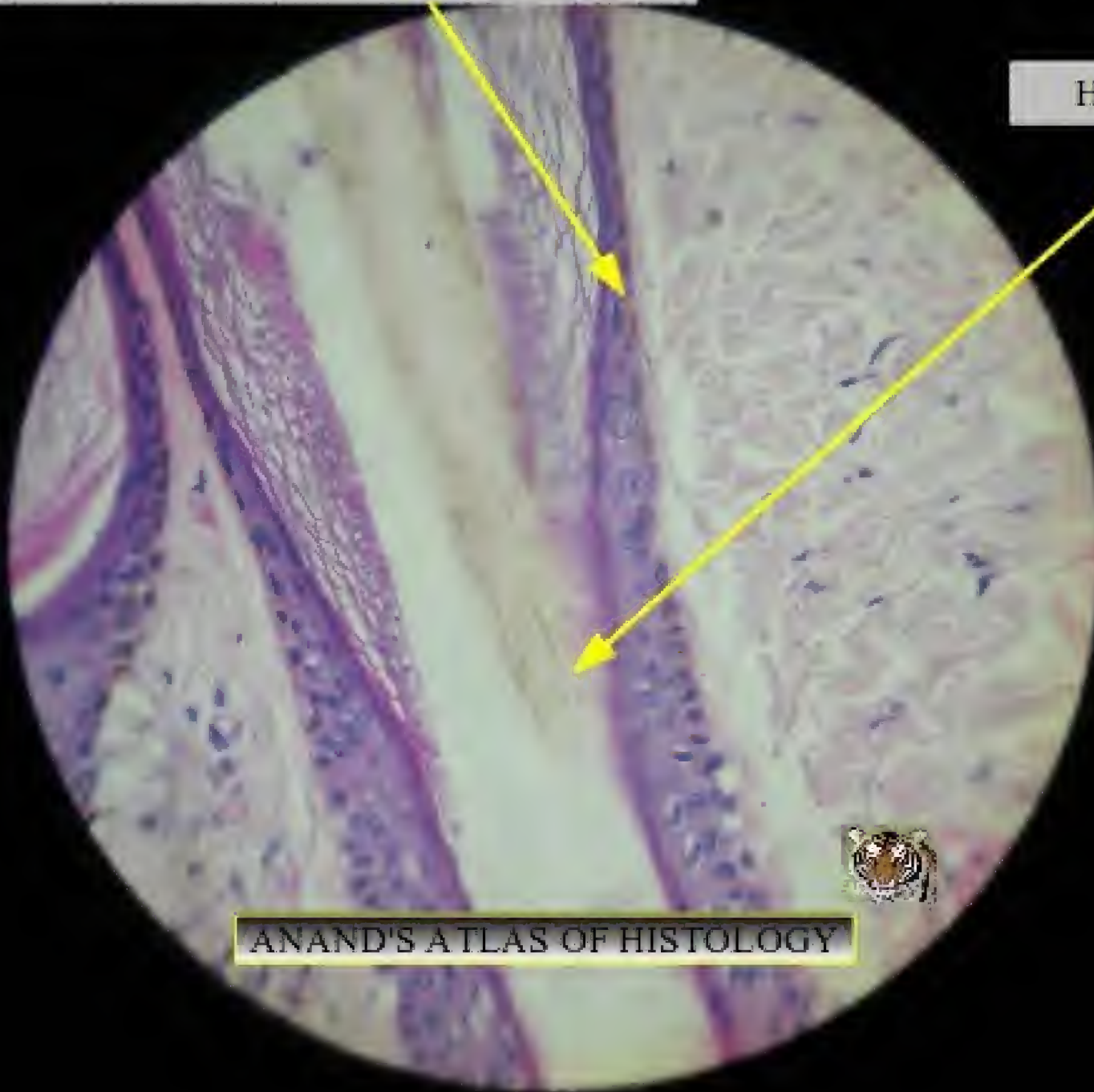
KERATIN LAYER



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STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

HAIR ROOT



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# THIN SKIN

## POINTS FOR IDENTIFICATION

1. PRESENCE OF HAIR FOLLICLE
2. LINED BY STRATIFIED SQUAMOUS KERATINISED EPITHELIUM
3. PRESENCE OF DERMIS AND EPIDERMIS



# PERIPHERAL NERVE – LONGITUDINAL SECTION

CUT SECTIONS OF AXONS



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NODES OF RANVIER

MYELIN SHEATH



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# PERIPHERAL NERVE – LONGITUDINAL SECTION

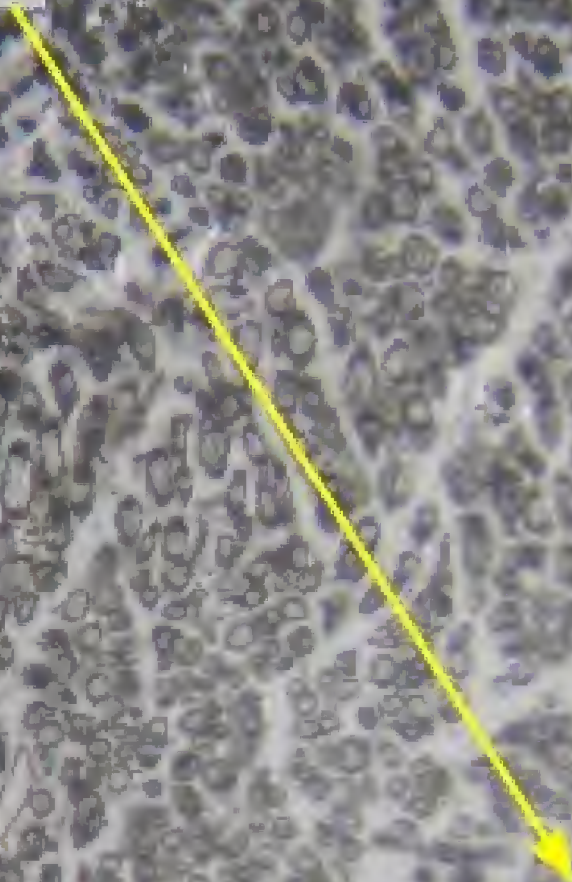
## POINTS FOR IDENTIFICATION

1. CUT SECTIONS OF AXONS ARE SEEN
2. AXONS ARE LINED BY MYELIN SHEATH
3. NODES OF RANVIER ARE SEEN



# PERIPHERAL NERVE – TRANSVERSE SECTION

NERVE BUNDLES





NERVE BUNDLES

PERINEURIUM

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# PERIPHERAL NERVE – TRANSVERSE SECTION

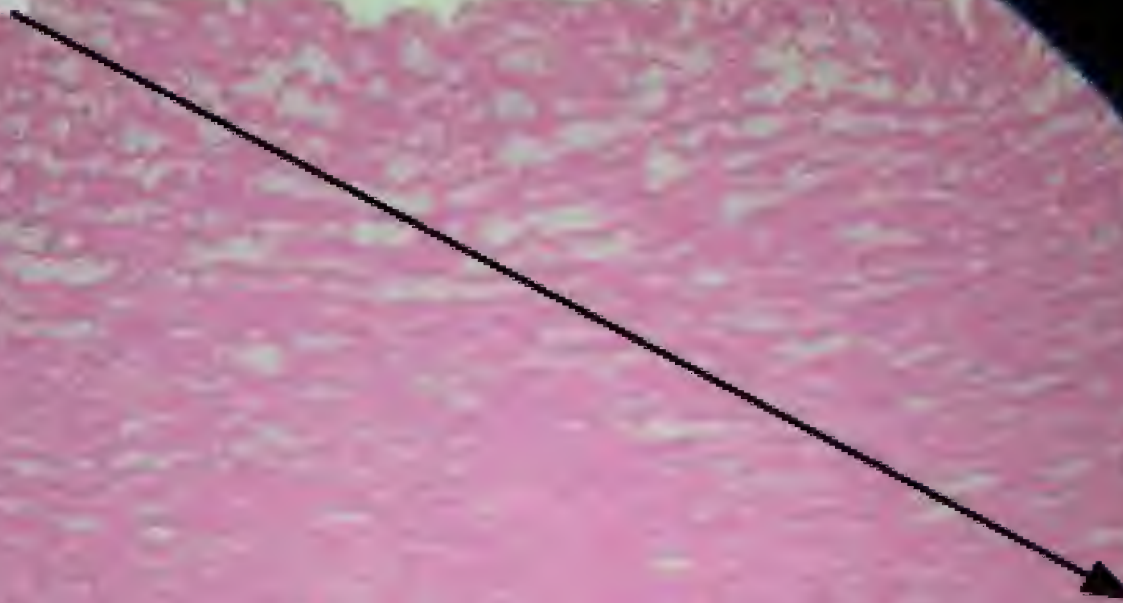
## POINTS FOR IDENTIFICATION

1. CUT SECTION OF NERVE FIBRE BUNDLES ARE SEEN
2. PERINEURIUM IS SEEN



# ELASTIC ARTERY

ELASTIC FIBRES



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TUNICA INTIMA



TUNICA MEDIA



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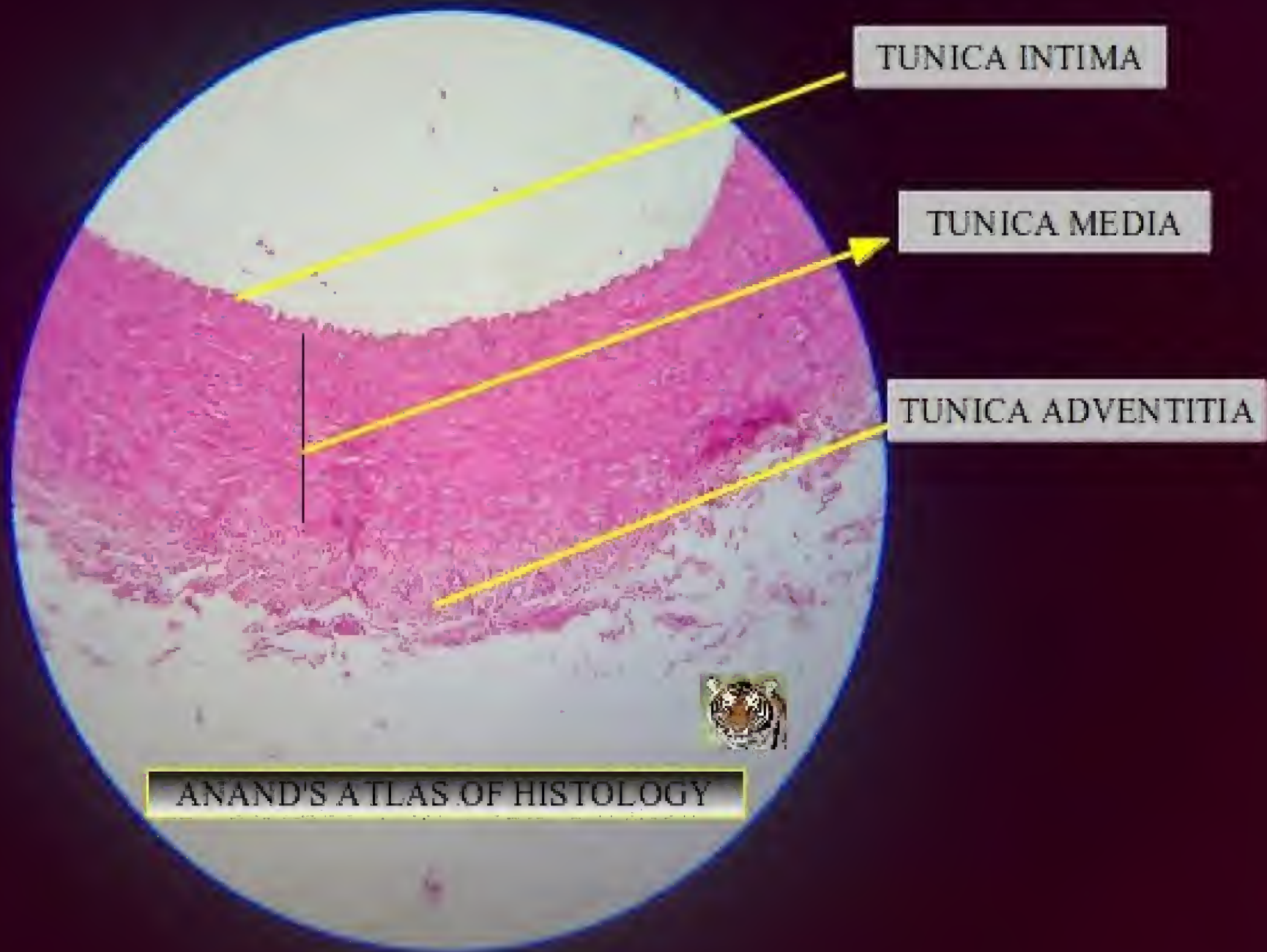
# ELASTIC ARTERY

## POINTS FOR IDENTIFICATION

1. CONSISTS OF THREE LAYERS, TUNICA INTIMA, TUNICA MEDIA AND TUNICA ADVENTITIA FROM INSIDE TO OUTSIDE
2. TUNICA MEDIA IS LARGE
3. TUNICA MEDIA PREDOMINANTLY CONSISTS OF ELASTIC FIBRES



# MUSCULAR ARTERY



TUNICA INTIMA

TUNICA MEDIA  
WITH  
SMOOTH MUSCLE  
FIBRES



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# MUSCULAR ARTERY

## POINTS FOR IDENTIFICATION

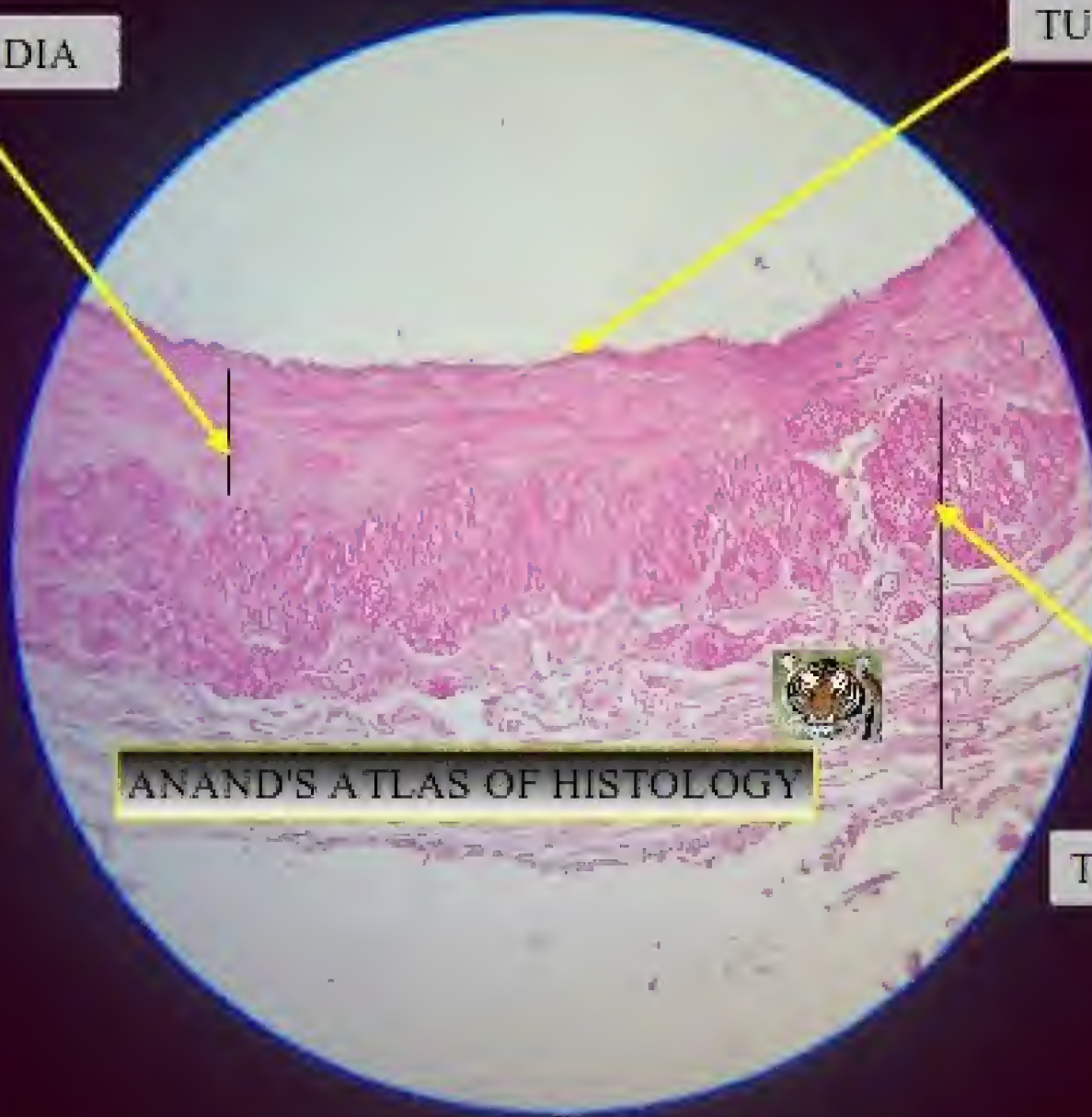
1. CONSISTS OF THREE LAYERS, TUNICA INTIMA, TUNICA MEDIA AND TUNICA ADVENTITIA FROM INSIDE TO OUTSIDE
2. TUNICA MEDIA IS LARGE
3. TUNICA MEDIA PREDOMINANTLY CONSISTS OF SMOOTH MUSCLE FIBRES



# LARGE VEIN

TUNICA MEDIA

TUNICA INTIMA

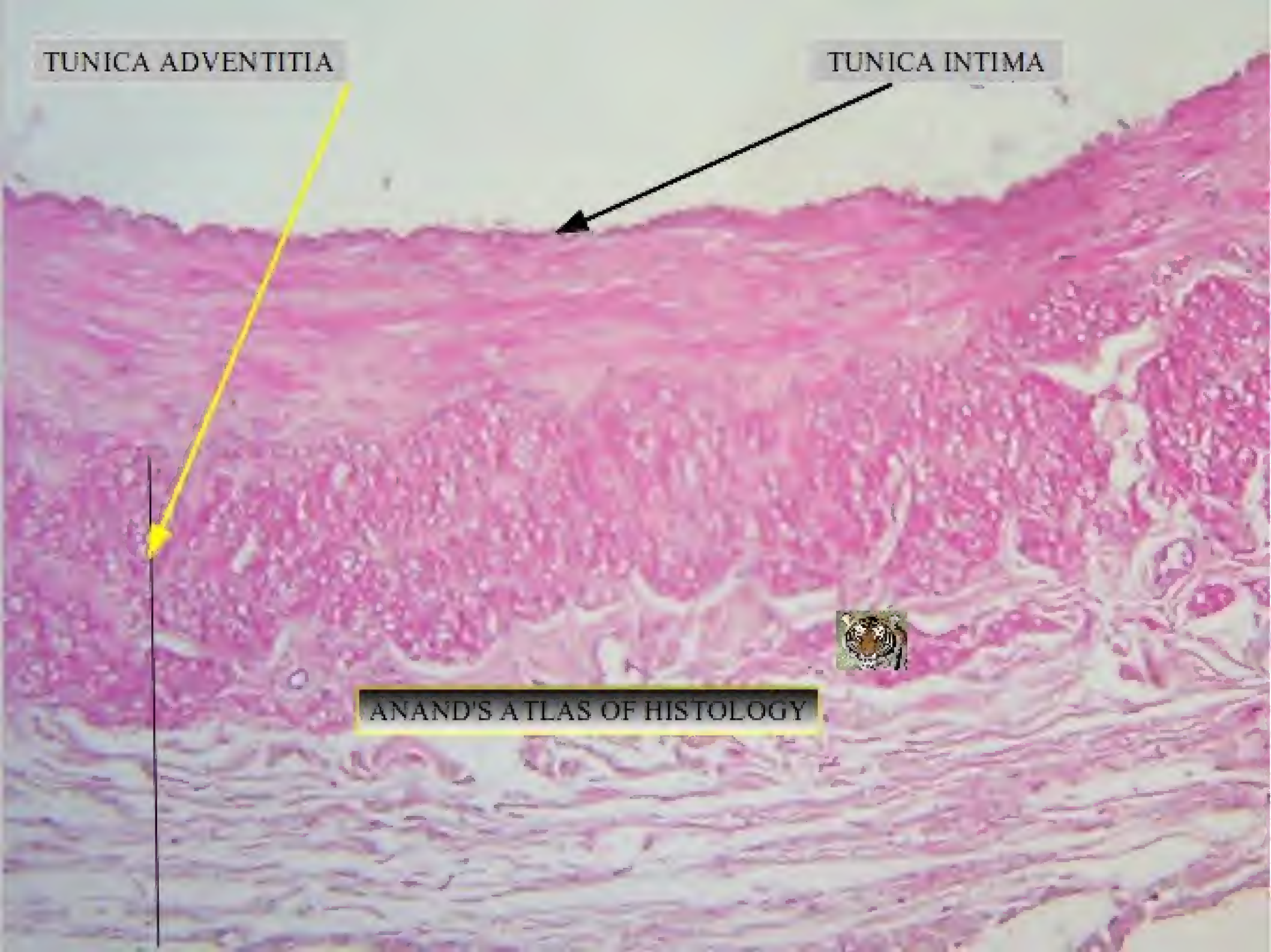


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TUNICA ADVENTITIA

TUNICA ADVENTITIA

TUNICA INTIMA



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# LARGE VEIN

## POINTS FOR IDENTIFICATION

1. CONSISTS OF THREE LAYERS, TUNICA INTIMA, TUNICA MEDIA AND TUNICA ADVENTITIA FROM INSIDE TO OUTSIDE
2. TUNICA ADVENTITIA IS LARGE
3. TUNICA ADVENTITIA PREDOMINANTLY CONSISTS OF SMOOTH MUSCLE FIBRES AND COLLAGEN FIBRES

## SECTION – 2

# SYSTEMIC HISTOLOGY

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# LIST OF SYSTEMS

LYMPHATIC SYSTEM

DIGESTIVE SYSTEM

RESPIRATORY SYSTEM

EXCRETORY SYSTEM

REPRODUCTIVE SYSTEM – MALE

REPRODUCTIVE SYSTEM – FEMALE



# LIST OF SYSTEMS

ENDOCRINE SYSTEM  
SPECIAL SENSORY ORGANS  
CENTRAL NERVOUS SYTEM

# LYMPHATIC SYSTEM

## LIST OF COLOUR PLATES

LYMPH NODE

SPLEEN

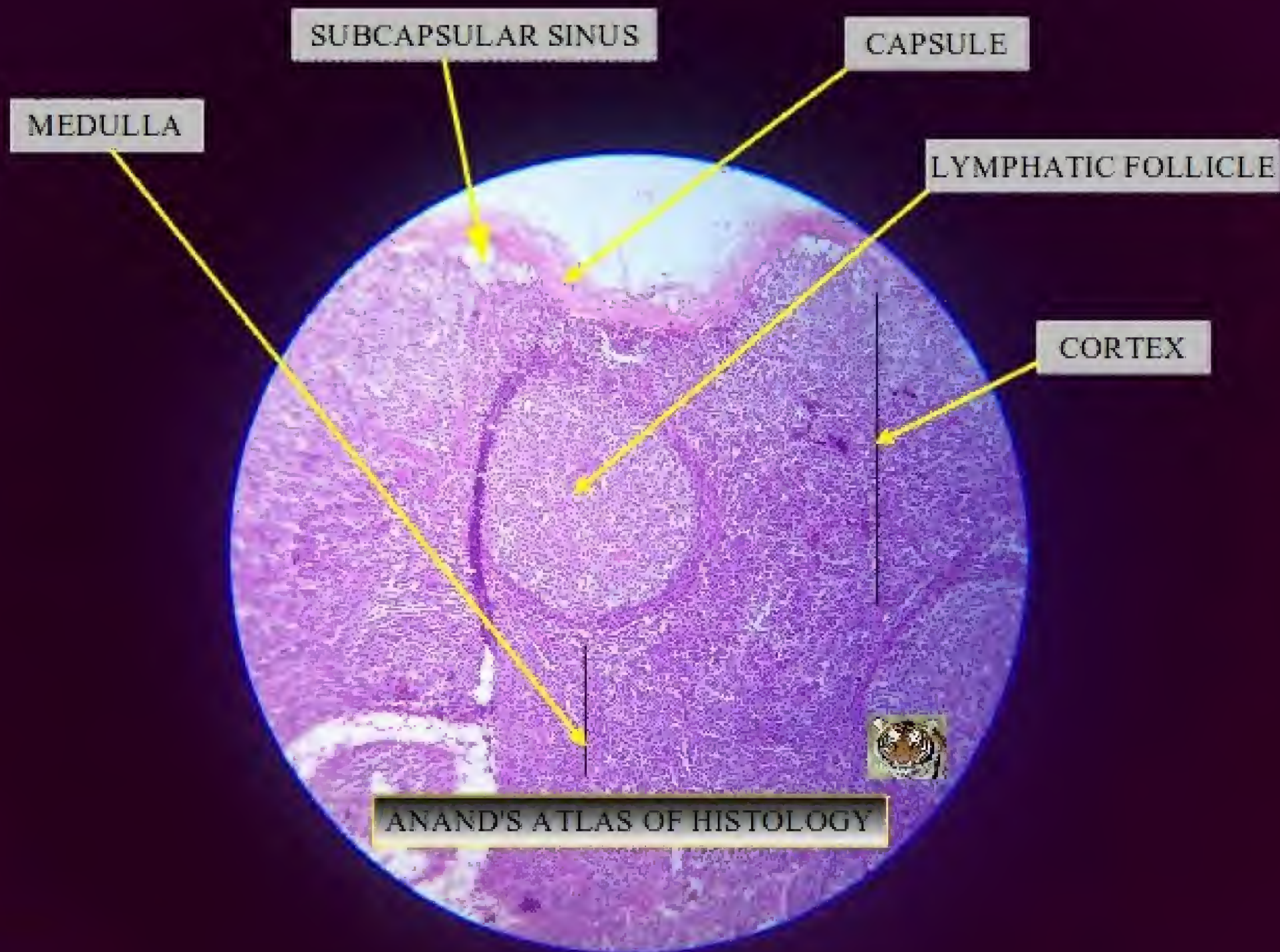
TONSIL

THYMUS

# LYMPH NODE

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MEDULLARY SINUS

GERMINAL CENTRE

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# LYMPH NODE

## POINTS FOR IDENTIFICATION

- 1.PRESENCE OF CORTEX AND MEDULLA**
- 2.PRESENCE OF LYMPHATIC FOLLICLES**
- 3.MEDULLA IS MADE UP OF LYMPHOCYTES  
ARRANGED AS MEDULLARY CORDS AND  
SEPARATED BY MEDULLARY SINUSES**



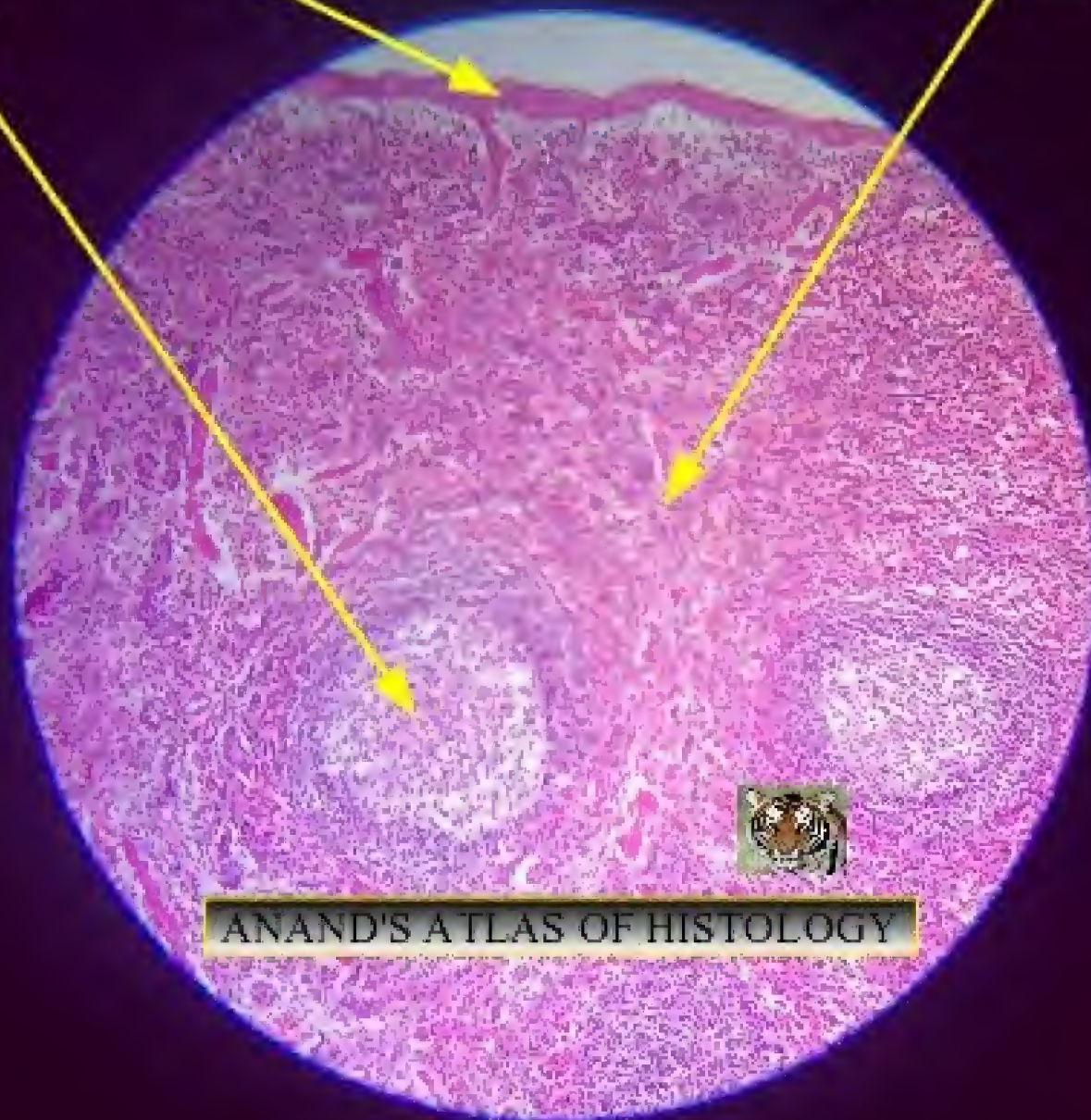
# SPLEEN

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OUTER CAPSULE

RED PULP

WHITE PULP

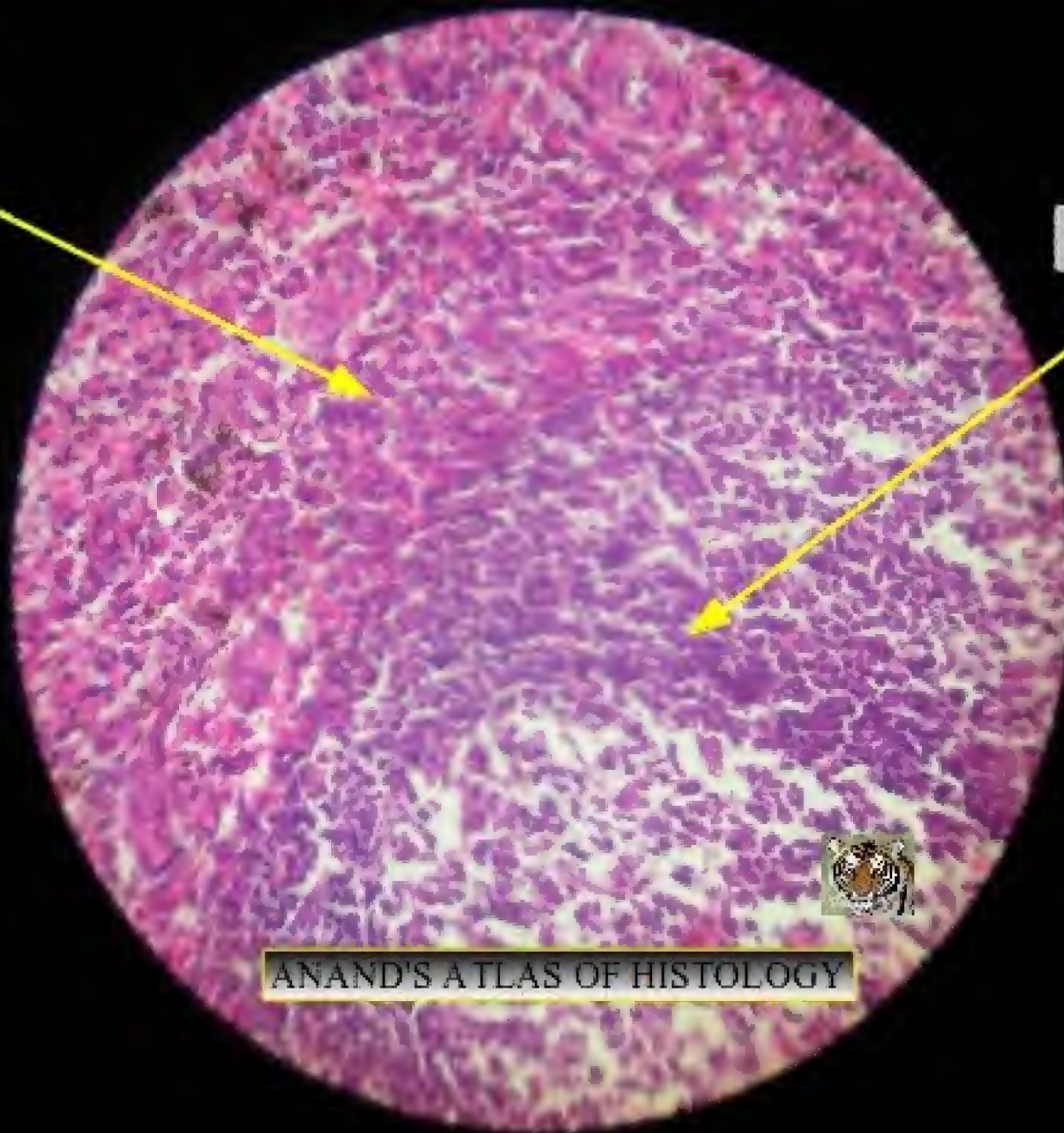


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RED PULP

WHITE PULP



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# SPLEEN

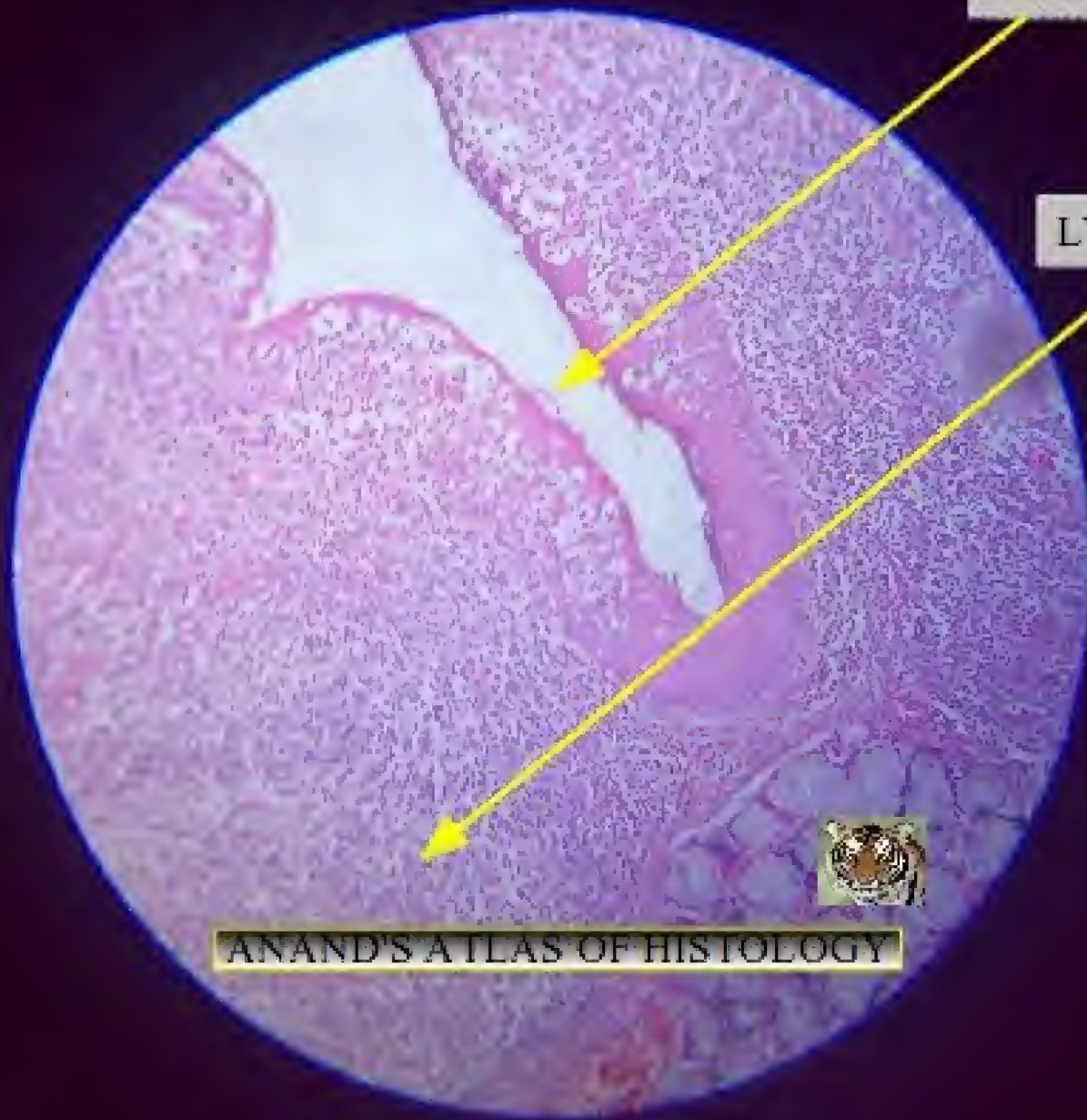
## POINTS FOR IDENTIFICATION

1. OUTER CAPSULE SENDS IN THICK SEPTAE
2. PRESENCE OF RED PULP
3. PRESENCE OF WHITE PULP

# TONSIL

TONSILLAR CRYPT

LYMPHATIC FOLLICLE

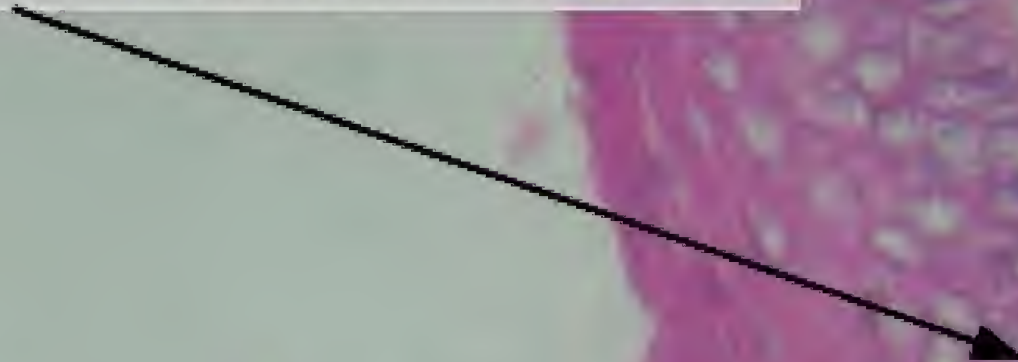


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STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM



# TONSIL

## POINTS FOR IDENTIFICATION

1. SECTION IS OF PALATINE TONSIL
2. IT IS LINED BY STRATIFIED SQUAMOUS  
NON KERATINISED EPITHELIUM
3. PRESENCE OF LYMPHATIC FOLLICLE
4. PRESENCE OF TONSILLAR CRYPT

# THYMUS

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THYMIC LOBE

CORTEX

MEDULLA



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LYMPHOCYTES

HASSAL'S CORPUSCLES



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# THYMUS

## POINTS FOR IDENTIFICATION

1. THYMUS IS DIVIDED INTO LOBES
2. EACH LOBE HAS A CORTEX AND A MEDULLA
3. CORTEX IS PACKED WITH LYMPHOCYTES
4. MEDULLA CONTAINS CORPUSCLES OF HASSAL



# DIGESTIVE SYSTEM

## LIST OF COLOUR PLATES

TONGUE – FILIFORM PAPILLAE

TONGUE – FUNGIFORM PAPILLAE

TONGUE – CIRCUMVALLATE PAPILLAE

SEROUS SALIVARY GLAND

MUCOUS SALIVARY GLAND

MIXED SALIVARY GLAND

# DIGESTIVE SYSTEM

## LIST OF COLOUR PLATES

TONGUE – FILIFORM PAPILLAE

TONGUE – FUNGIFORM PAPILLAE

TONGUE – CIRCUMVALLATE PAPILLAE

SEROUS SALIVARY GLAND

MUCOUS SALIVARY GLAND

MIXED SALIVARY GLAND

# DIGESTIVE SYSTEM

## LIST OF COLOUR PLATES

OESOPHAGUS

STOMACH – FUNDUS

STOMACH – PYLORUS

DUODENUM

JEJUNUM

ILEUM



# DIGESTIVE SYSTEM

## LIST OF COLOUR PLATES

VERMIFORM APPENDIX  
LARGE INTESTINE ( COLON )  
LIVER  
GALL BLADDER  
PANCREAS

# TONGUE – FILIFORM PAPILLAE

STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

SHARP CONICAL TIP

FILIFORM PAPILLA

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TIP IS KERATINISED



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# TONGUE – FILIFORM PAPILLAE

## POINTS FOR IDENTIFICATION

1. LINED BY STRATIFIED SQUAMOUS KERATINISED EPITHELIUM
2. TIPS ARE KERATINISED
3. SHARP CONICAL APPEARANCE

# TONGUE – FUNGIFORM PAPILLA



STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

FUNGIFORM PAPILLA

FILIFORM PAPILLA



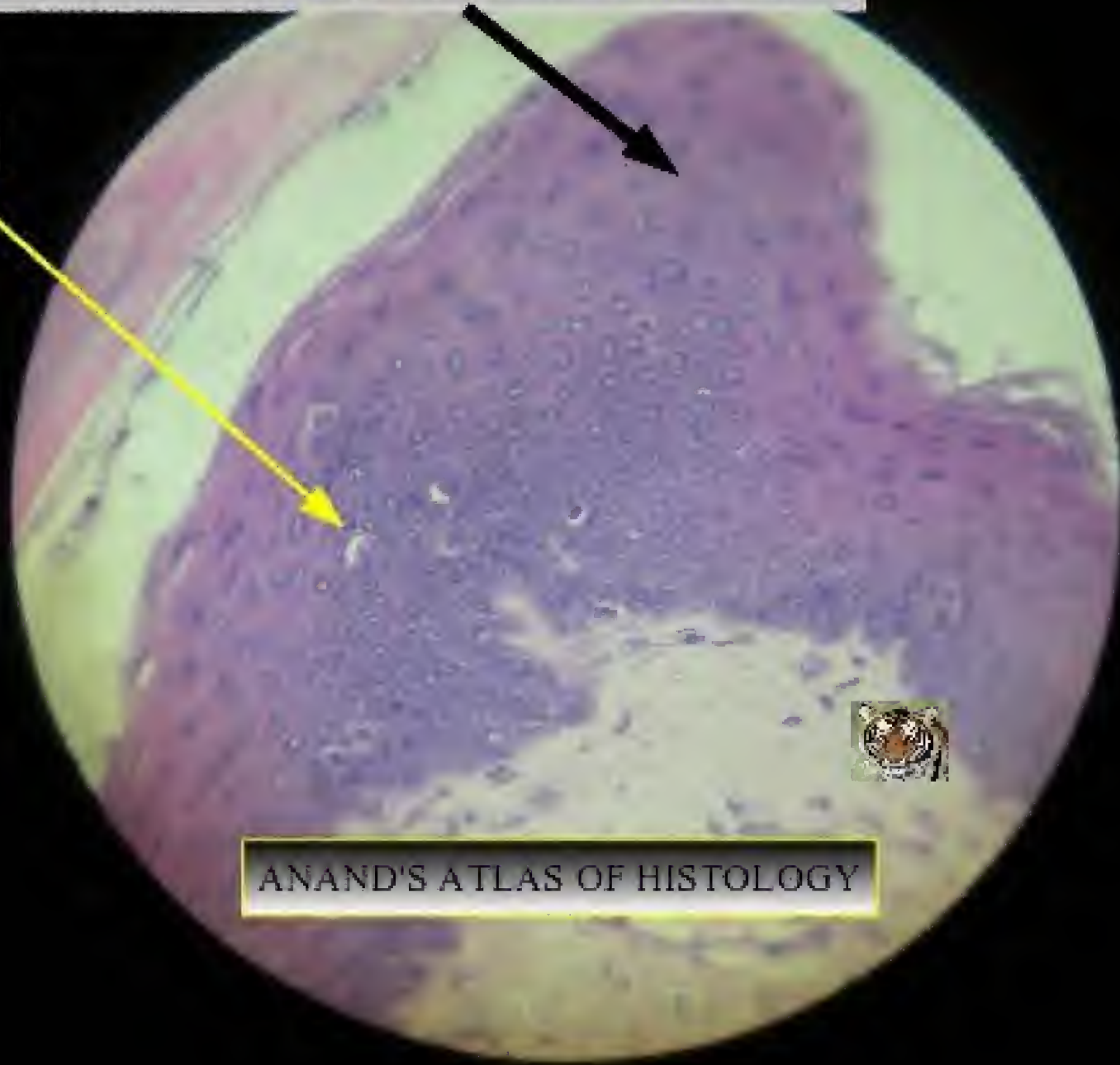
CIRCUMVALLATE PAPILLA

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STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

TASTE BUD



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# TONGUE – FUNGIFORM PAPILLAE

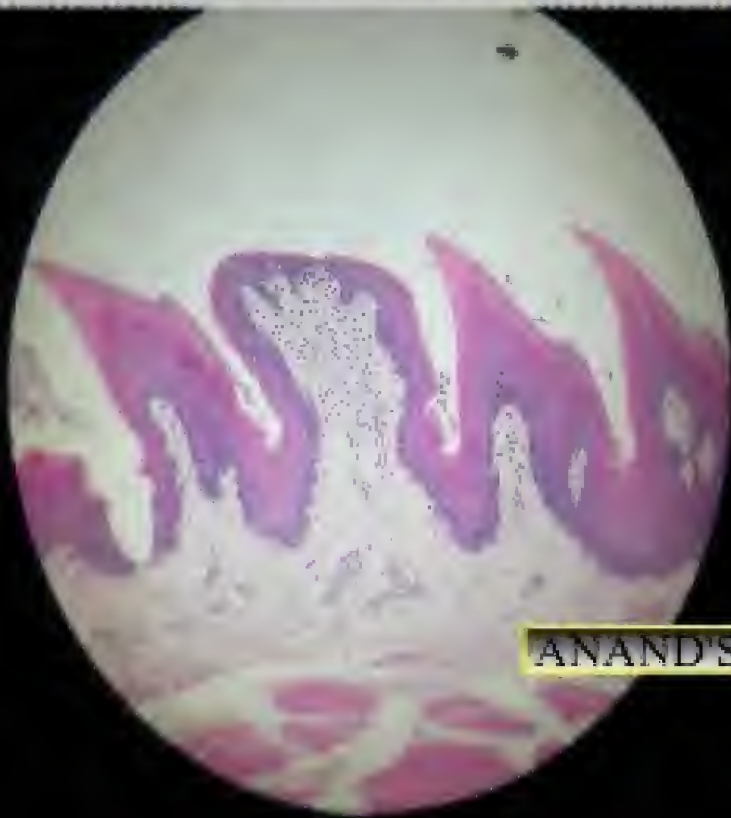
## POINTS FOR IDENTIFICATION

1. LINED BY STRATIFIED SQUAMOUS  
NON KERATINISED EPITHELIUM
2. PRESENCE OF TASTE BUDS



STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

TASTE BUD



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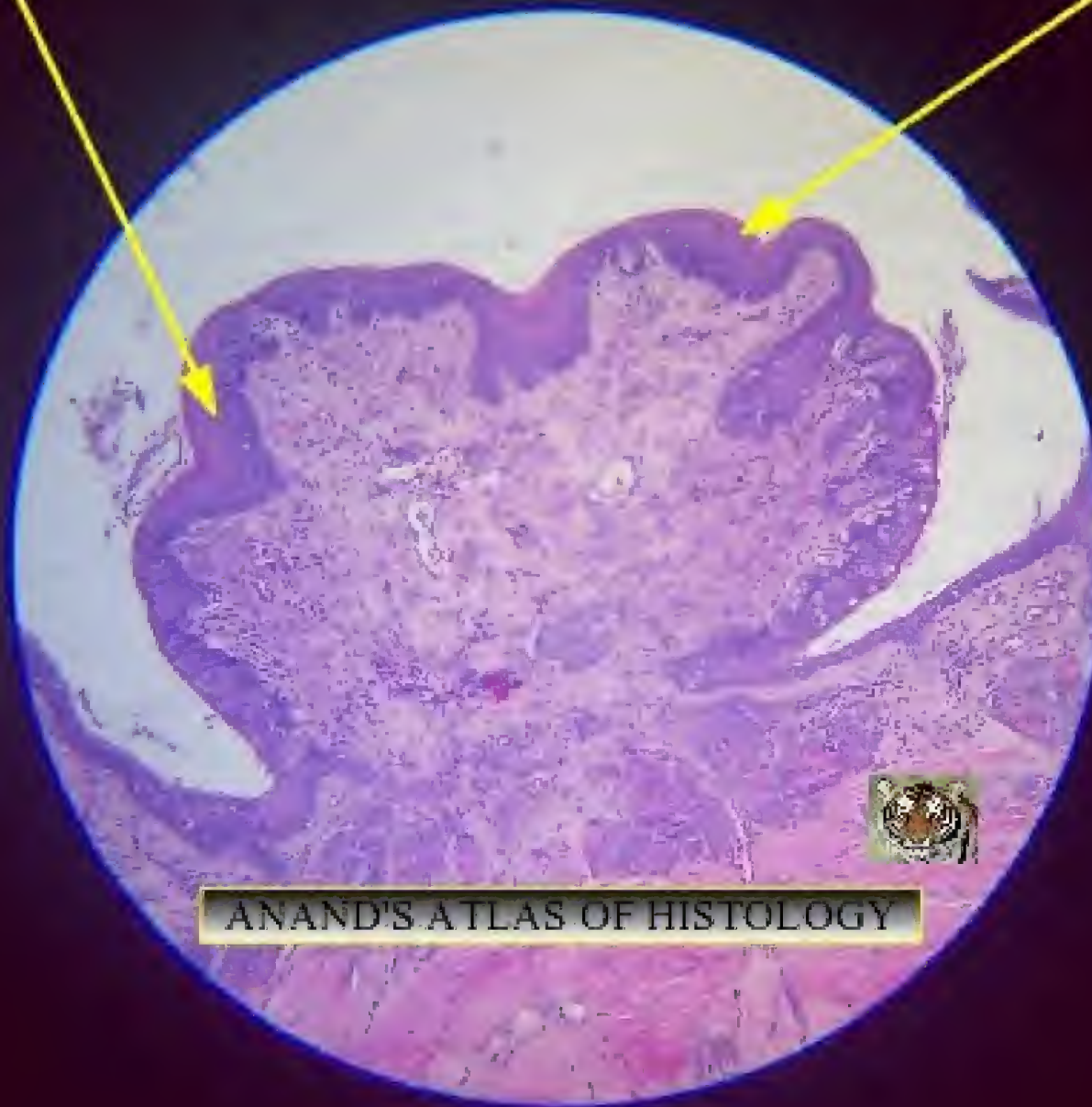


FUNGIFORM PAPILLAE IS USUALLY NON KERATINISED STRATIFIED SQUAMOUS EPITHELIUM. HOWEVER IN SOME CASES THE EPITHELIUM CAN BE KERATINISED AS SHOWN IN THE PICTURE HOWEVER TO DIFFERENTIATE IT FROM FILIFORM PAPILLAE THERE WOULD BE TASTE BUDS

# TONGUE - CIRCUMVALLATE PAPILLAE

STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

LARGEST OF ALL  
TONGUE PAPILLAE



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TASTE BUD



STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM



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# TONGUE – CIRCUMVALLATE PAPILLAE

## POINTS FOR IDENTIFICATION

1. LINED BY STRATIFIED SQUAMOUS NON  
KERATINISED EPITHELIUM
2. PRESENCE OF TASTE BUDS
3. LARGEST OF ALL TONGUE PAPILLAE

# SEROUS SALIVARY GLAND



BLOOD VESSEL

DUCT

SEPTA

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SEROUS ACINI

DUCT

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# SEROUS SALIVARY GLAND

## POINTS FOR IDENTIFICATION

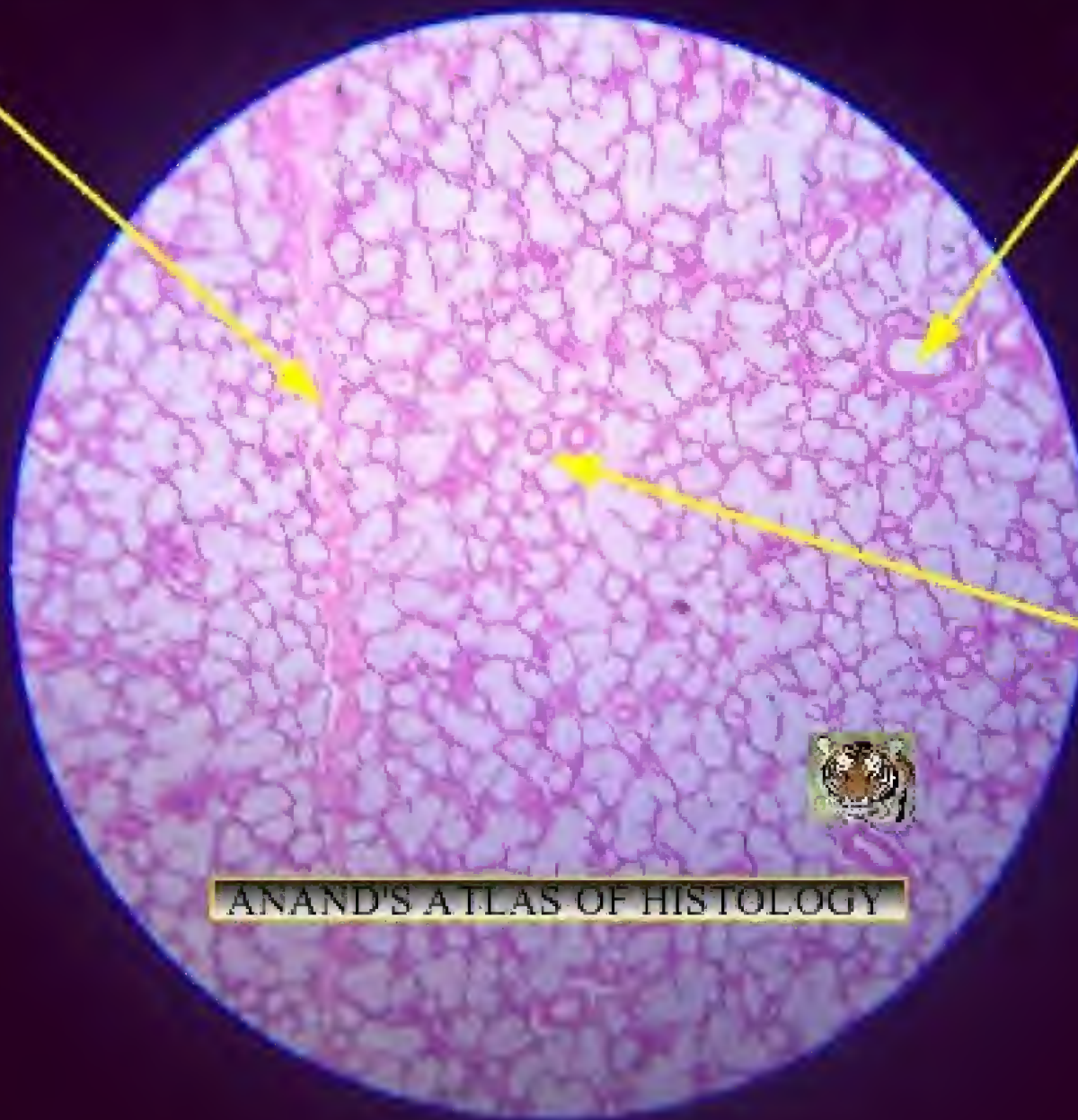
1. SEROUS ACINI ARE PREDOMINANT
2. INTRA LOBULAR DUCTS ARE PRESENT
3. SEROUS CELLS ARE PYRAMIDAL IN SHAPE WITH A BASAL NUCLEUS



# MUCOUS SALIVARY GLAND

SEPTA

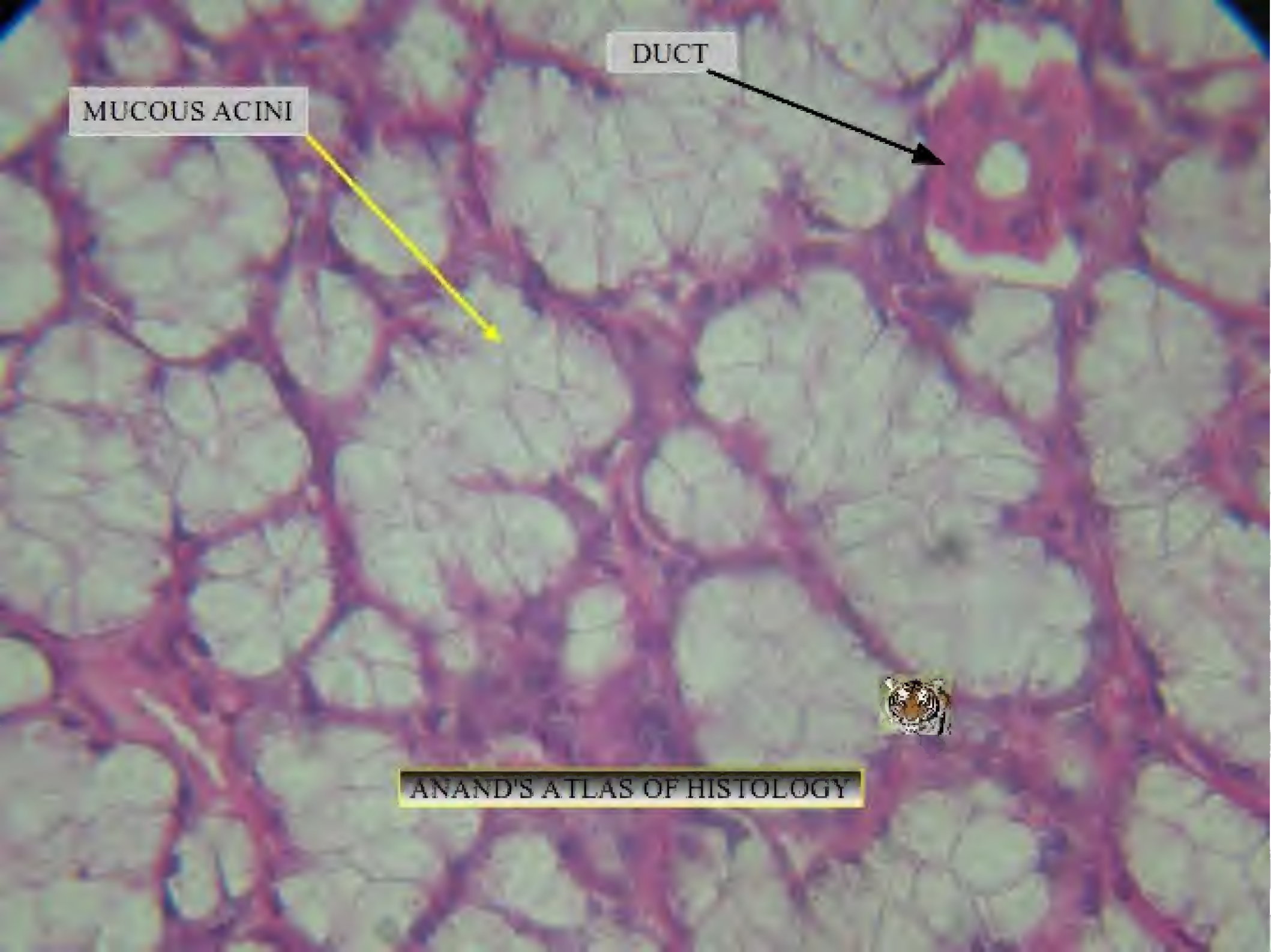
BLOOD VESSEL



DUCT



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DUCT

MUCOUS ACINI



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# MUCOUS SALIVARY GLAND

## POINTS FOR IDENTIFICATION

1. MUCOUS ACINI ARE  
PREDOMINANT
2. INTRALOBULAR DUCTS ARE SEEN
3. MUCOUS ACINI ARE PALE STAINED  
WITH FLAT BASAL NUCLEUS

# MIXED SALIVARY GLAND

SEPTA

MUCOUS ACINI

SEROUS ACINI



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SEROUS DEMILUNES

DUCT



# MIXED SALIVARY GLAND

## POINTS FOR IDENTIFICATION

1. BOTH SEROUS AND MUCOUS ACINI ARE PRESENT
2. INTRALOBULAR DUCTS ARE SEEN
3. SEROUS DEMILUNES ARE SEEN

# OESOPHAGUS



STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

OESOPHAGEAL  
GLANDS

SKELETAL MUSCLE



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STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

SKELETAL MUSCLE



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# OESOPHAGUS

## POINTS FOR IDENTIFICATION

1. LINING EPITHELIUM OF THORACIC PART OF OESOPHAGUS IS STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM
2. SUBMUCOSA CONTAINS OESOPHAGEAL GLANDS ( BOTH SEROUS AND MUCOUS GLANDS)
3. MUSCULAR COAT IS MADE OF SKELETAL MUSCLE IN THE THORACIC PART



# STOMACH - FUNDUS

GASTRIC GLANDS

MUCOSA

MUSCULAR COAT

SUBMUCOSA

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GASTRIC PIT

SIMPLE COLUMNAR EPITHELIUM

GASTRIC GLANDS



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# STOMACH – FUNDUS

## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS AND LINED BY SIMPLE COLUMNAR EPITHELIUM
2. GASTRIC GLANDS ARE LONG WHEREAS THE GASTRIC PITS ARE SHALLOW
3. GASTRIC GLANDS OPEN INTO THE GASTRIC PITS

# STOMACH - PYLORUS

PYLORIC GLANDS

GASTRIC FOLDS

SUBMUCOSA

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PYLORIC GLANDS

GASTRIC PIT

SIMPLE COLUMNAR EPITHELIUM

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# STOMACH – PYLORUS

## POINTS FOR IDENTIFICATION

1. GASTRIC FOLDS ARE LONG AND NARROW
2. PYLORIC GLANDS ARE SHORTER AND OPEN INTO THE GASTRIC PITS
3. MUCOSA IS LINED BY SIMPLE COLUMNAR EPITHELIUM

# DUODENUM

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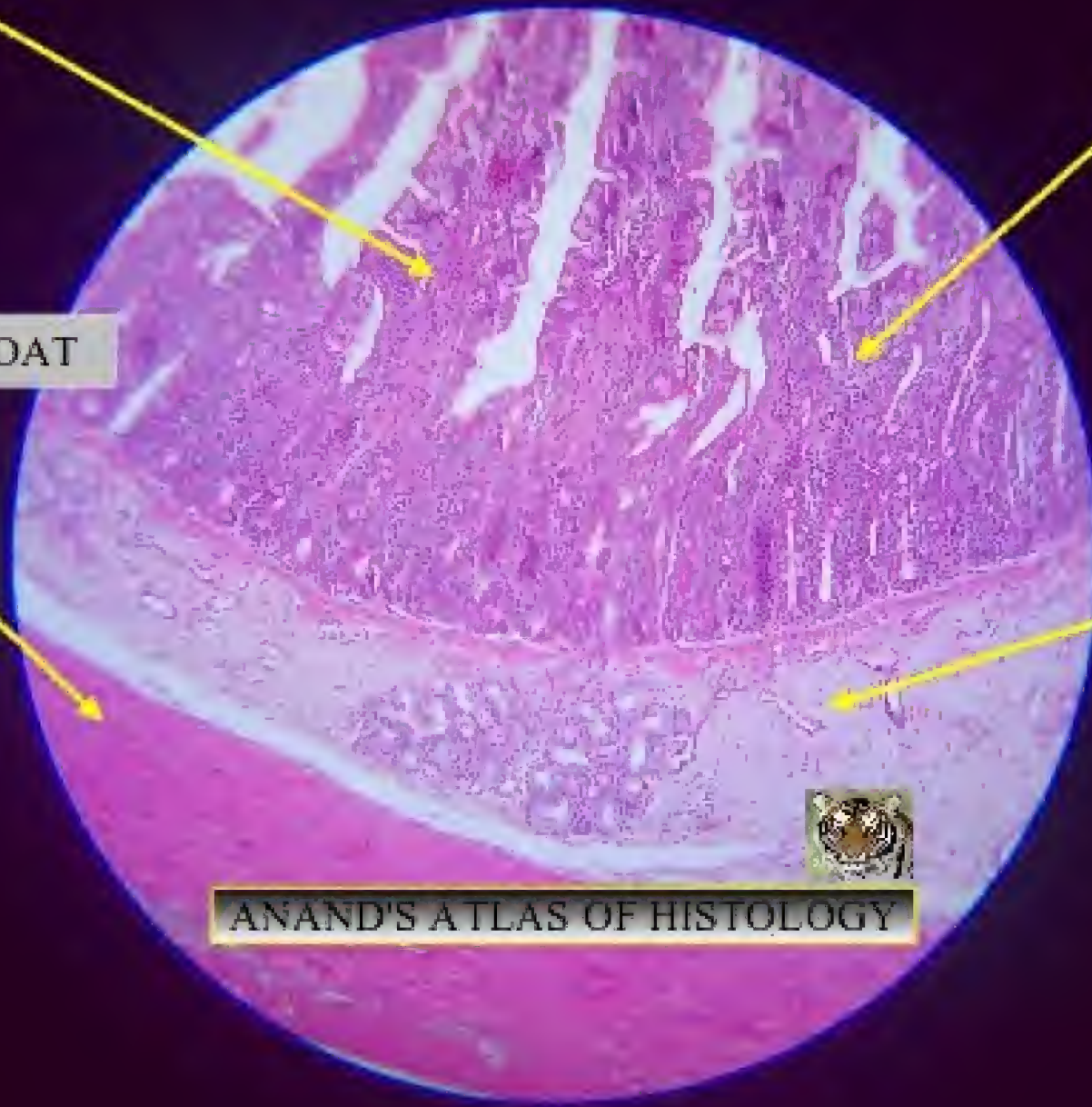
VILLUS

MUCOSA

MUSCULAR COAT

SUBMUCOSA

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BRUNNER'S GLANDS  
IN SUBMUCOSA

MUSCULARIS INTERNA





# DUODENUM

## POINTS FOR IDENTIFICATION

1. MUCOSAL FOLDS ARE TERMED AS VILLI
2. VILLI ARE LONG AND NUMEROUS
3. BRUNNER'S GLANDS ARE SEEN IN SUBMUCOSA



# JEJUNUM

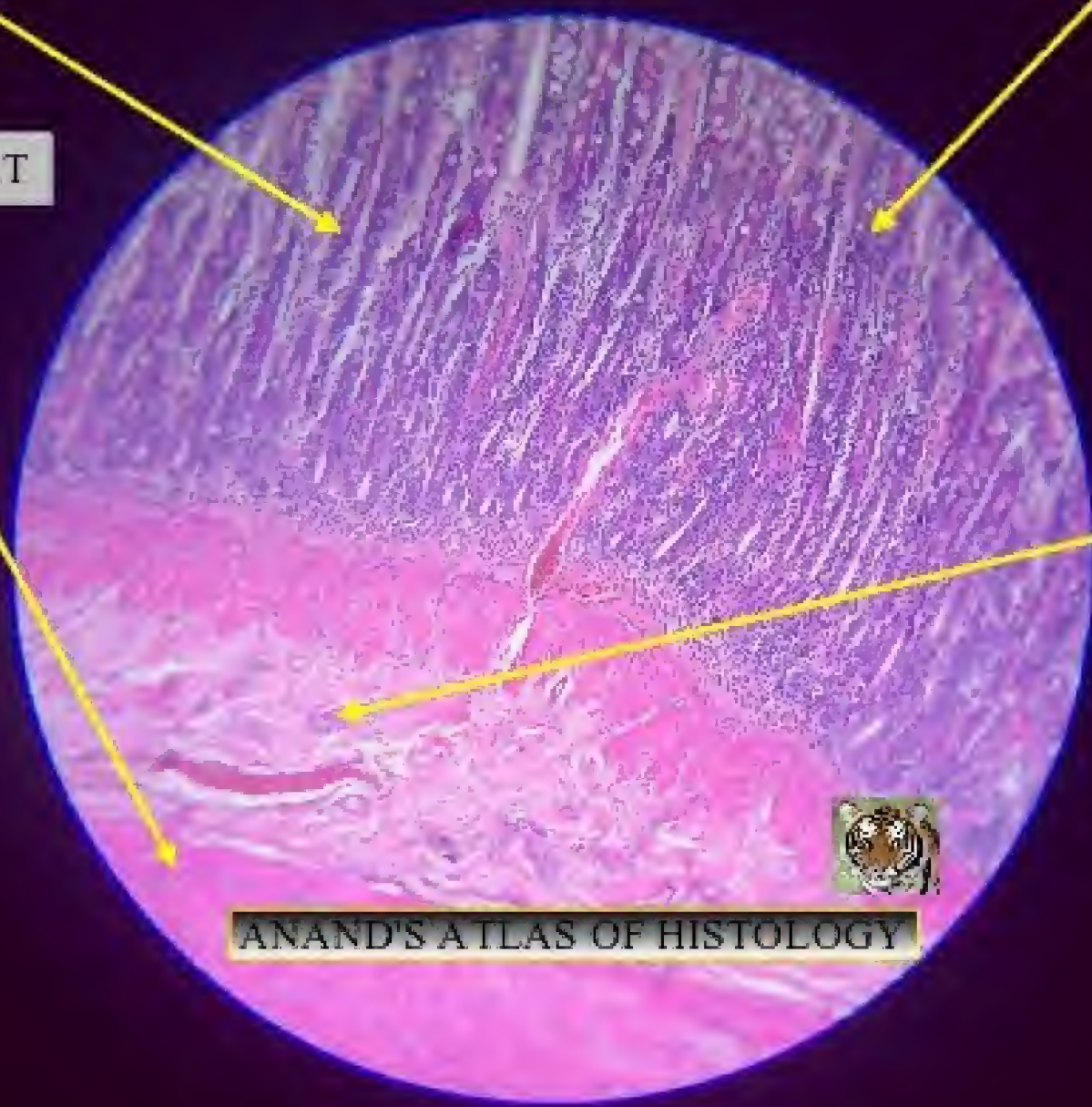
ANAND'S ATLAS OF HISTOLOGY

VILLI

MUCOSA

MUSCULAR COAT

SUBMUCOSA



ANAND'S ATLAS OF HISTOLOGY



GOBLET CELL

MICROVILLI



ANAND'S ATLAS OF HISTOLOGY



# JEJUNUM

## POINTS FOR IDENTIFICATION

1. MUCOSA CONTAINS NUMEROUS GOBLET CELLS
2. MICROVILLI ARE PRESENT IN THE LINING EPITHELIUM
3. VILLI ARE LONG AND PROMINENT

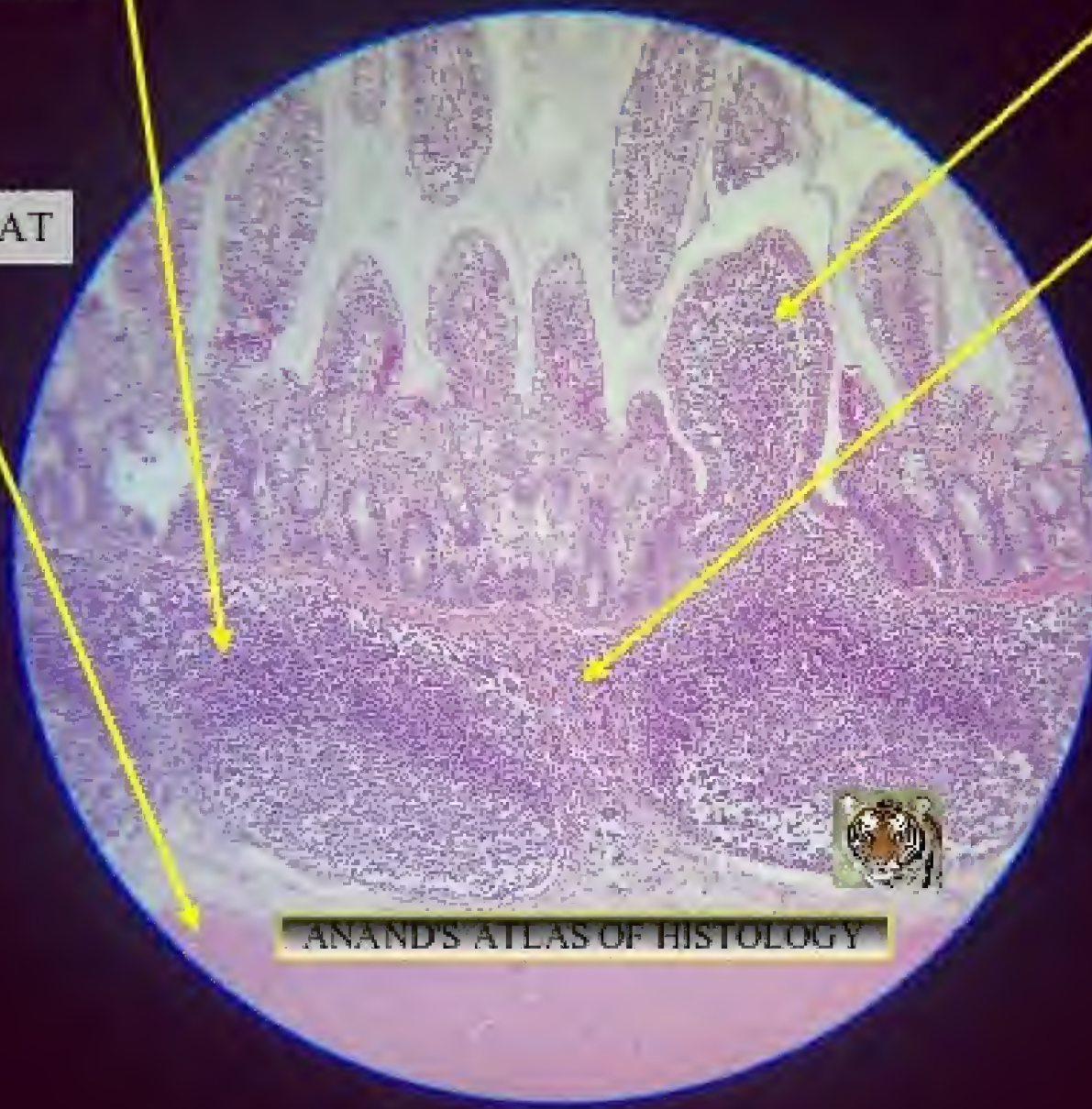
# ILEUM

PEYER'S PATCHES

MUCOSA

SUBMUCOSA

MUSCULAR COAT



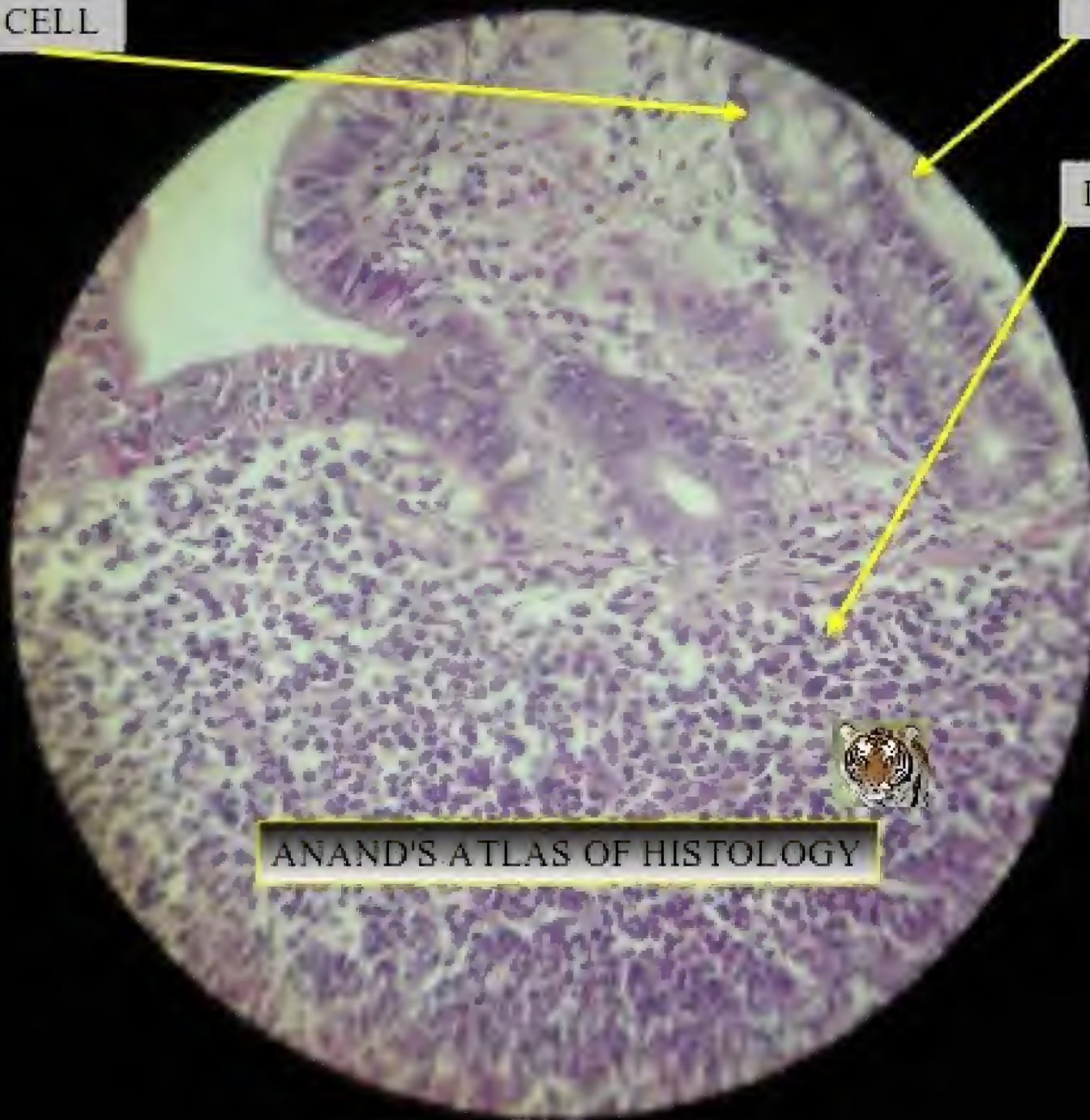
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GOBLET CELL

MUCOSA

LYMPHOCYTE



ANAND'S ATLAS OF HISTOLOGY



# ILEUM

## POINTS FOR IDENTIFICATION

1. VILLI ARE SHORT AND FEW
2. SUB MUCOSA CONTAINS LYMPHATIC AGGREGATIONS CALLED AS PEYER'S PATCHES

# VERMIFORM APPENDIX



GUT ASSOCIATED LYMPHOID TISSUE

LUMEN

MUCOSA

SUB MUCOSA



ANAND'S ATLAS OF HISTOLOGY



GOBLET CELL

MUCOSA

LYMPHOCYTES



ANAND'S ATLAS OF HISTOLOGY



# VERMIFORM APPENDIX

## POINTS FOR IDENTIFICATION

1. MUCOSA IS LINED BY SIMPLE COLUMNAR EPITHELIUM
2. SUBMUCOSA CONTAINS LYMPHOID AGGREGATIONS
3. GOBLET CELLS ARE SEEN

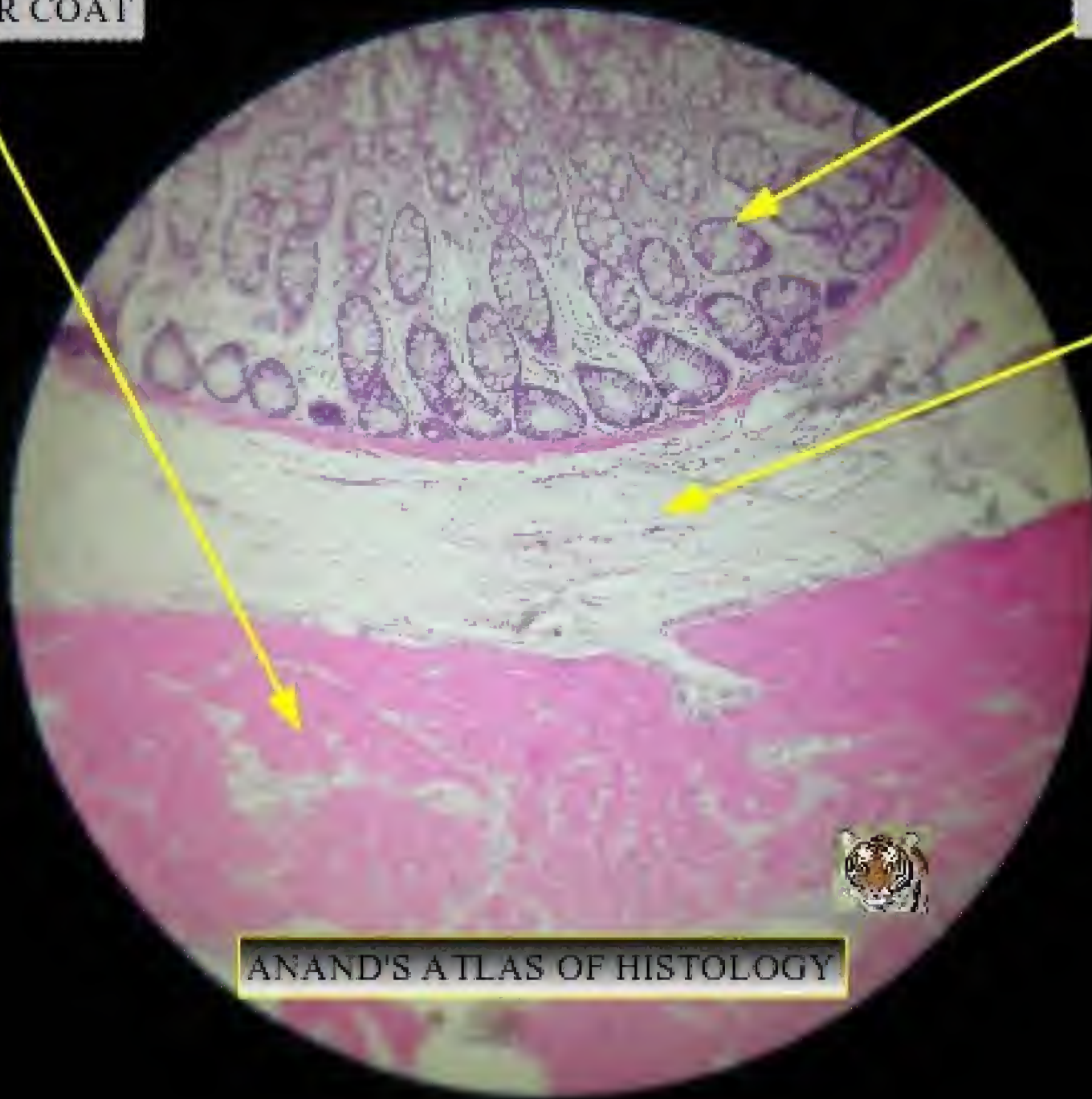


# LARGE INTESTINE (COLON)

MUSCULAR COAT

MUCOSA

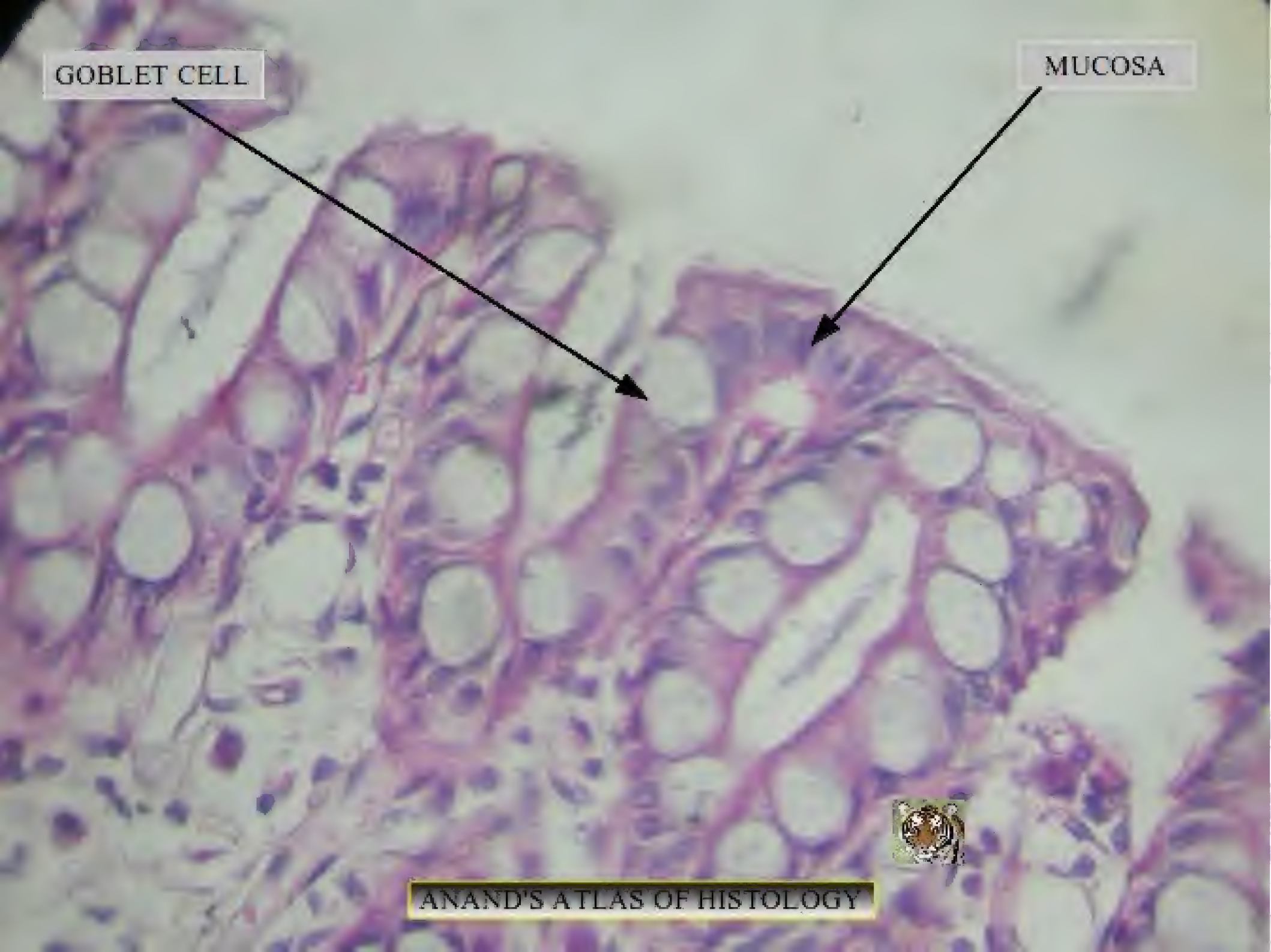
SUB MUCOSA



ANAND'S ATLAS OF HISTOLOGY

GOBLET CELL

MUCOSA





# LARGE INTESTINE (COLON)

## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS AND CONTAINS NUMEROUS GOBLET CELLS
2. MUCOSA IS LINED BY SIMPLE COLUMNAR EPITHELIUM
3. MUSCULAR COAT IS THICK AND ARRANGED AS THREE LAYERS

# LIVER



CENTRAL VEIN

HEPATOCYTES

SINUSOID

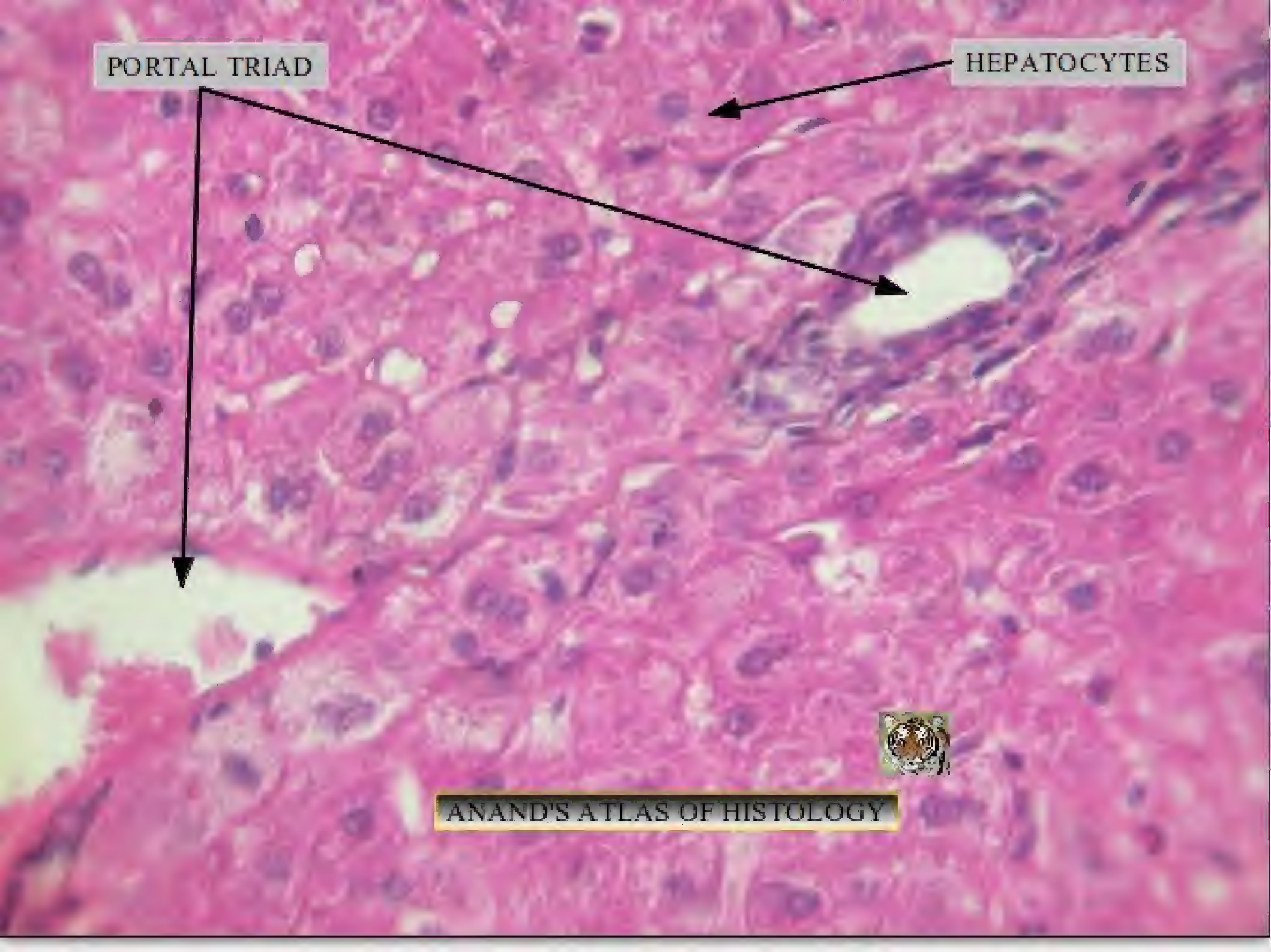


ANAND'S ATLAS OF HISTOLOGY



PORTAL TRIAD

HEPATOCYTES



ANAND'S ATLAS OF HISTOLOGY

# LIVER

## POINTS FOR IDENTIFICATION

1. HEPATOCYTES ARRANGED IN ROWS  
RADIATE IN ALL DIRECTIONS FROM THE  
CENTRAL VEIN
2. SINUSOIDS ARE PRESENT BETWEEN  
ADJACENT ROWS OF HEPATOCYTES
3. PRESENCE OF PORTAL TRIAD

# GALL BLADDER

ANAND'S ATLAS OF HISTOLOGY

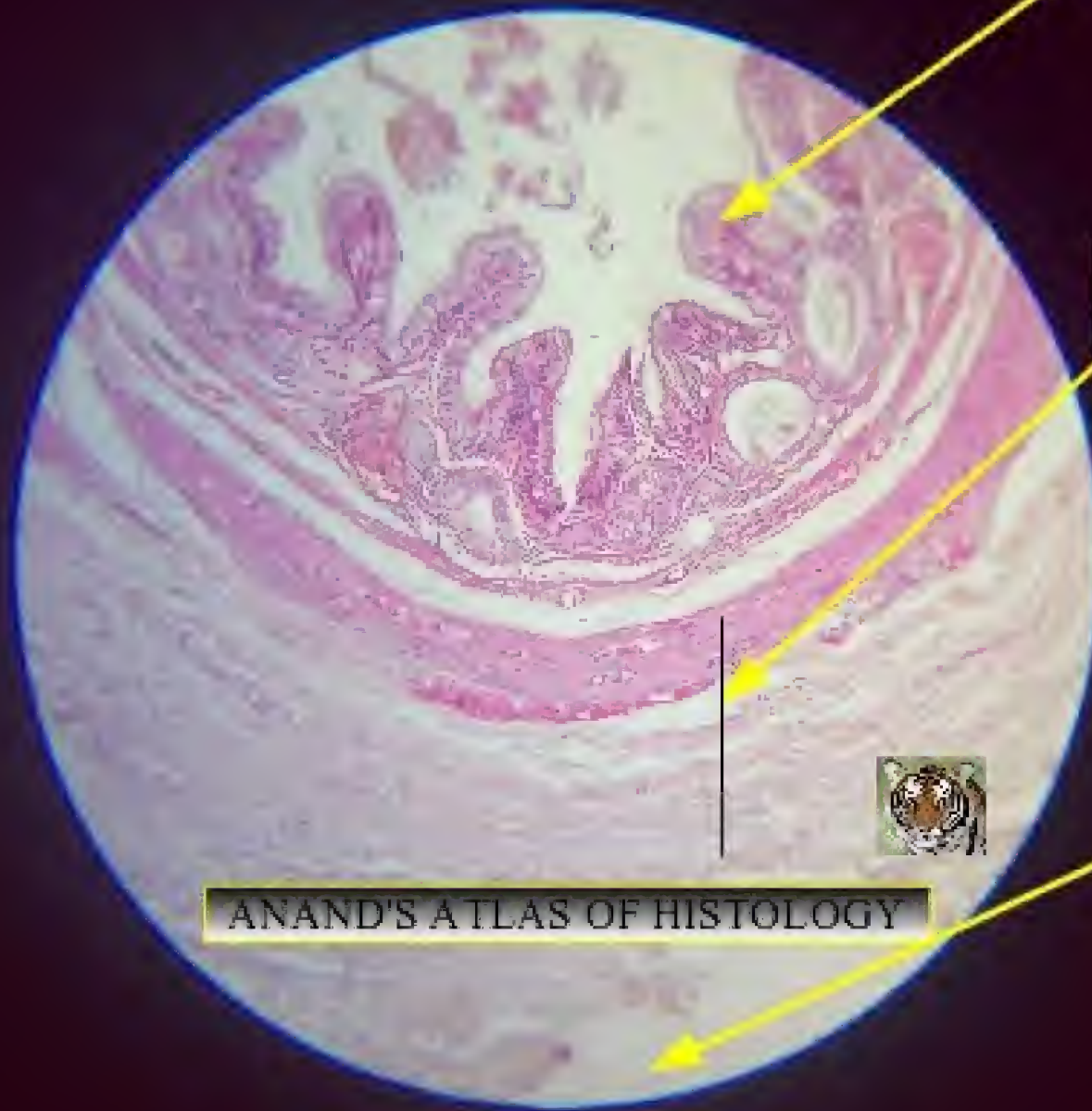


MUCOSA

FIBROMUSCULAR  
COAT

SEROSAL COAT

ANAND'S ATLAS OF HISTOLOGY



MUCOSA

MICROVILLI

TALL COLUMNAR  
EPITHELIUM



ANAND'S ATLAS OF HISTOLOGY



# GALL BLADDER

## POINTS FOR IDENTIFICATION

1. MUCOSA IS LINED BY TALL COLUMNAR CELLS WITH MICROVILLI
2. FIBROMUSCULAR COAT IS MADE OF COLLAGEN FIBRES, SMOOTH MUSCLE FIBRES AND ELASTIC FIBRES



# PANCREAS

ANAND'S ATLAS OF HISTOLOGY

CENTROACINAR CELLS



PANCREATIC ISLET



ANAND'S ATLAS OF HISTOLOGY





CENTROACINAR CELLS

ISLET OF LANGERHANS

ANAND'S ATLAS OF HISTOLOGY





# PANCREAS

## POINTS FOR IDENTIFICATION

1. EXOCRINE PART SHOWS  
CENTROACINAR CELLS AND DUCTS
2. ENDOCRINE PART SHOWS ISLETS  
OF LANGERHANS

# RESPIRATORY SYSTEM

## LIST OF COLOUR PLATES

TRACHEA

LUNG

# TRACHEA



MUCOSA

SUBMUCOSA

HYALINE CARTILAGE



ANAND'S ATLAS OF HISTOLOGY

PSEUDOSTRATIFIED CILIATED COLUMNAR EPITHELIUM



TRACHEAL GLANDS



ANAND'S ATLAS OF HISTOLOGY



# TRACHEA

## POINTS FOR IDENTIFICATION

1. MUCOSA IS LINED BY PSEUDOSTRATIFIED CILIATED COLUMNAR EPITHELIUM
2. PRESENCE OF TRACHEAL GLANDS
3. PRESENCE OF HYALINE CARTILAGE

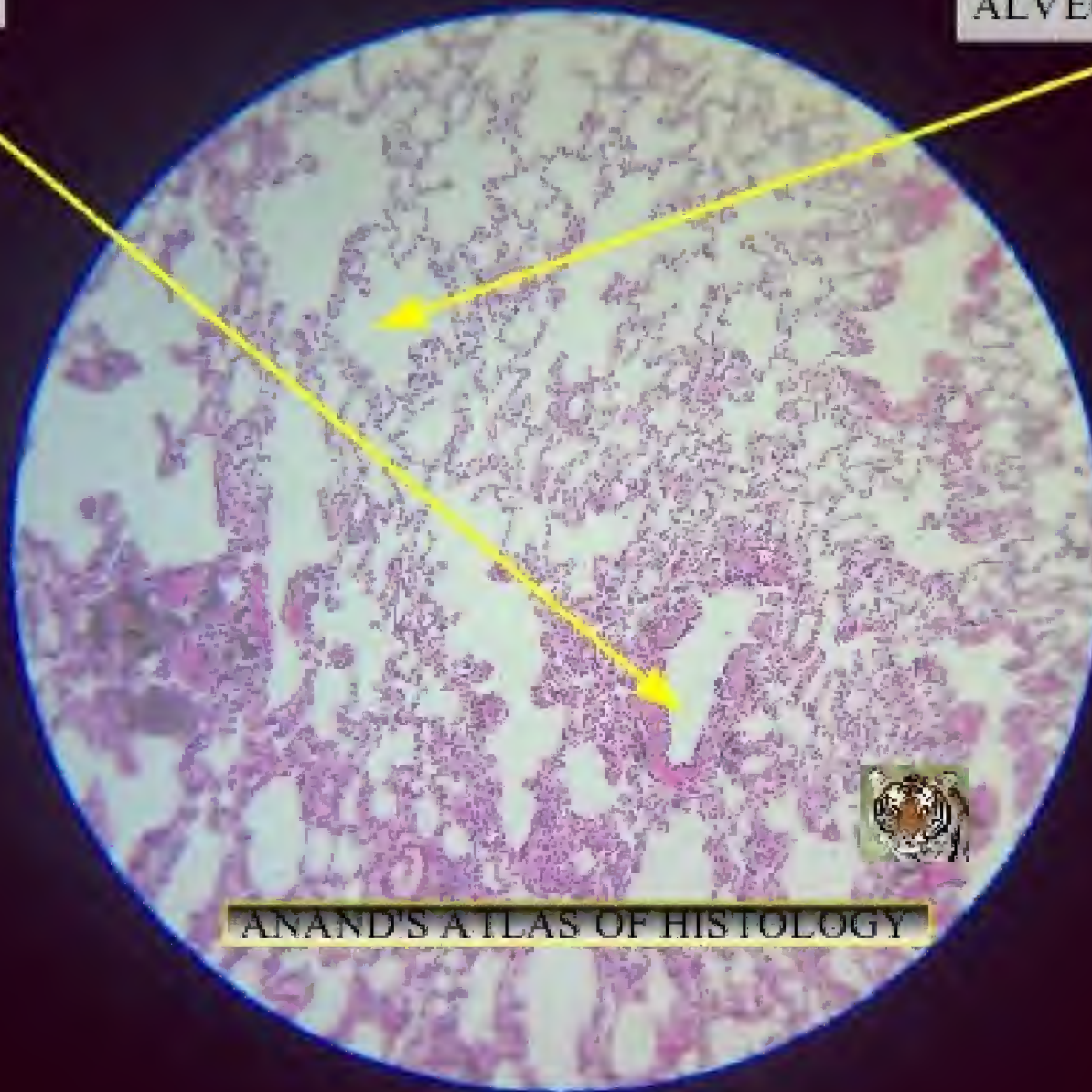


# LUNG

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BRONCHIOLE

ALVEOLUS



ANAND'S ATLAS OF HISTOLOGY



SIMPLE SQUAMOUS EPITHELIUM  
(ENDOTHELIUM)

ALVEOLUS



ANAND'S ATLAS OF HISTOLOGY



# LUNG

## POINTS FOR IDENTIFICATION

1. PRESENCE OF ALVEOLI
2. ALVEOLI ARE LINED BY SIMPLE SQUAMOUS EPITHELIUM
3. PRESENCE OF ALVEOLAR DUCTS AND ALVEOLAR SACS

# EXCRETORY SYSTEM

## LIST OF COLOUR PLATES

KIDNEY

URETER

URINARY BLADDER

# KIDNEY

ANAND'S ATLAS OF HISTOLOGY



CUT SECTIONS OF PROXIMAL  
CONVOLUTED TUBULE

RENAL CORTEX

GLOMERULUS

CUT SECTIONS OF DISTAL  
CONVOLUTED TUBULE

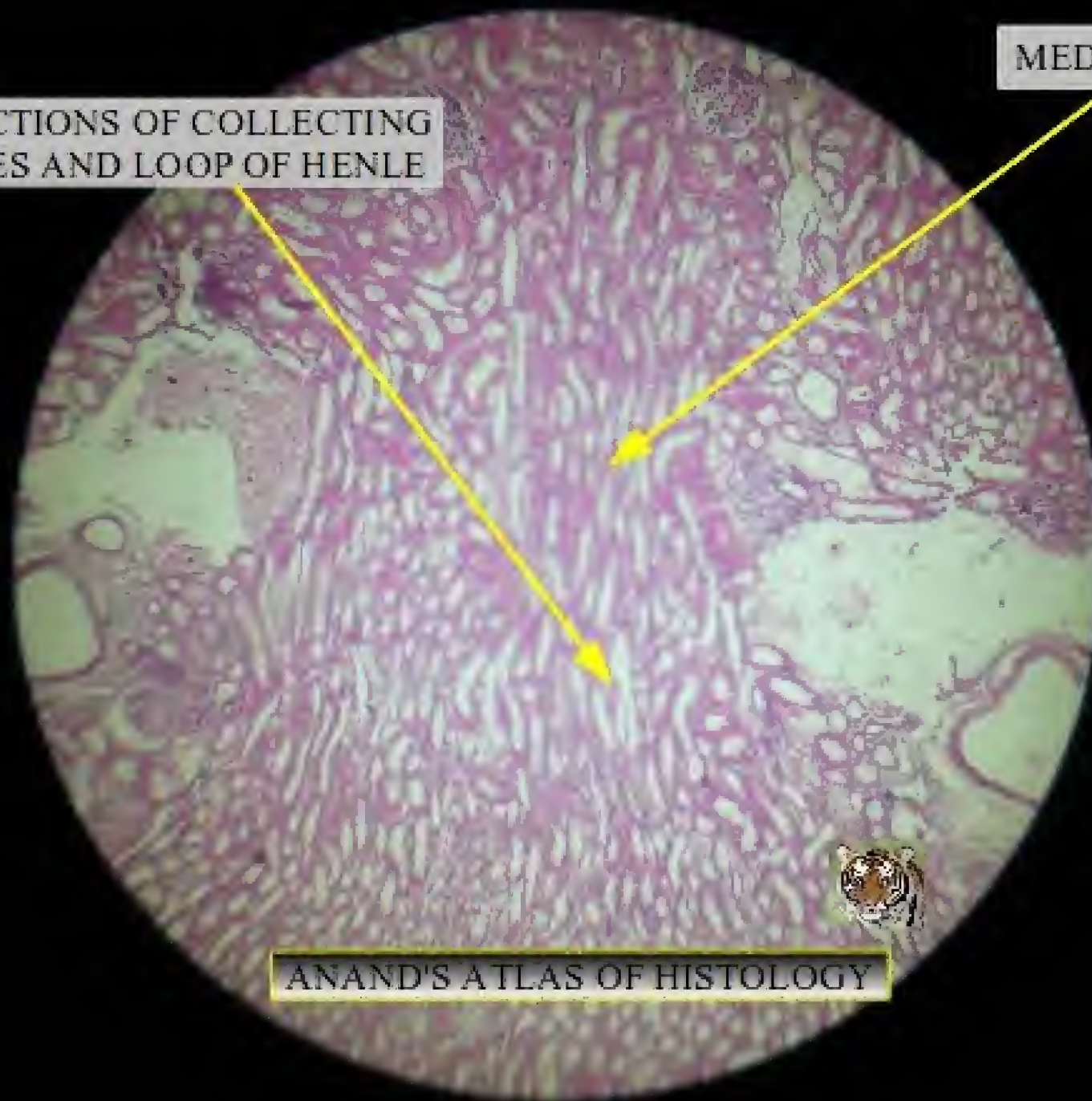


ANAND'S ATLAS OF HISTOLOGY

# RENAL MEDULLA

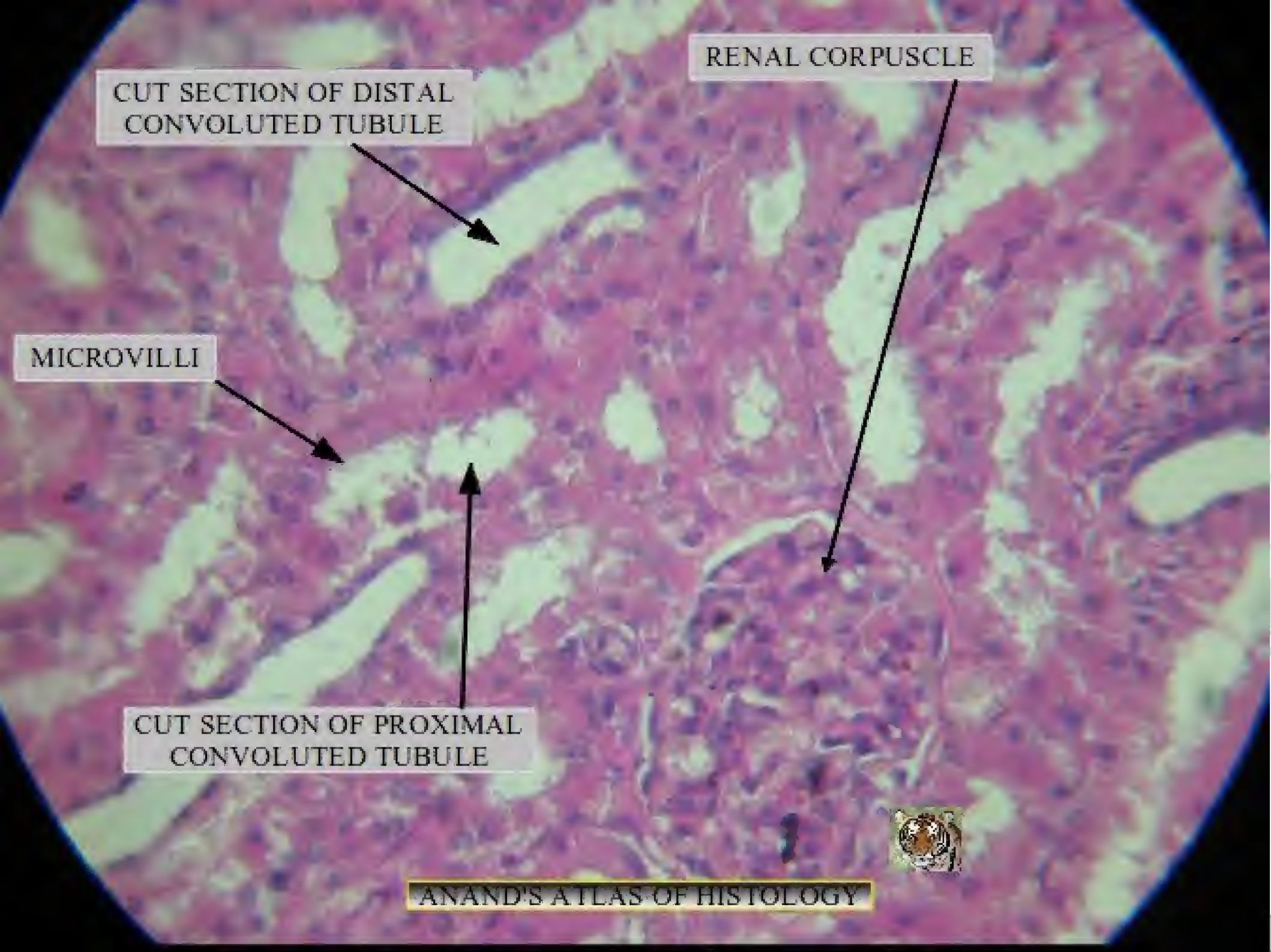
MEDULLARY RAYS

CUT SECTIONS OF COLLECTING  
TUBULES AND LOOP OF HENLE



ANAND'S ATLAS OF HISTOLOGY





RENAL CORPUSCLE

CUT SECTION OF DISTAL  
CONVOLUTED TUBULE

MICROVILLI

CUT SECTION OF PROXIMAL  
CONVOLUTED TUBULE





# KIDNEY

## POINTS FOR IDENTIFICATION

1. CUT SECTION OF KIDNEY SHOWS RENAL CORTEX AND RENAL MEDULLA
2. RENAL CORTEX SHOWS CUT SECTIONS OF RENAL CORPUSCLES, PROXIMAL AND DISTAL CONVOLUTED TUBULES
3. RENAL MEDULLA SHOWS CUT SECTIONS OF COLLECTING DUCTS PROJECTING INTO THE CORTEX AS MEDULLARY RAYS

# URETER

MUCOSA

LUMEN

MUSCULAR COAT





LUMEN

UPPER DOME SHAPED CELL

TRANSITIONAL CELL EPITHELIUM  
(UROTHELIUM)

MUSCULAR COAT



ANAND'S ATLAS OF HISTOLOGY

# URETER

## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS
2. MUCOSA IS LINED BY  
TRANSITIONAL CELL EPITHELIUM
3. MUSCULAR COAT IS MADE OF  
THREE LAYERS

# URINARY BLADDER

ANAND'S ATLAS OF HISTOLOGY



MUSCULAR COAT

TRANSITIONAL CELL EPITHELIUM  
(UROTHELIUM)

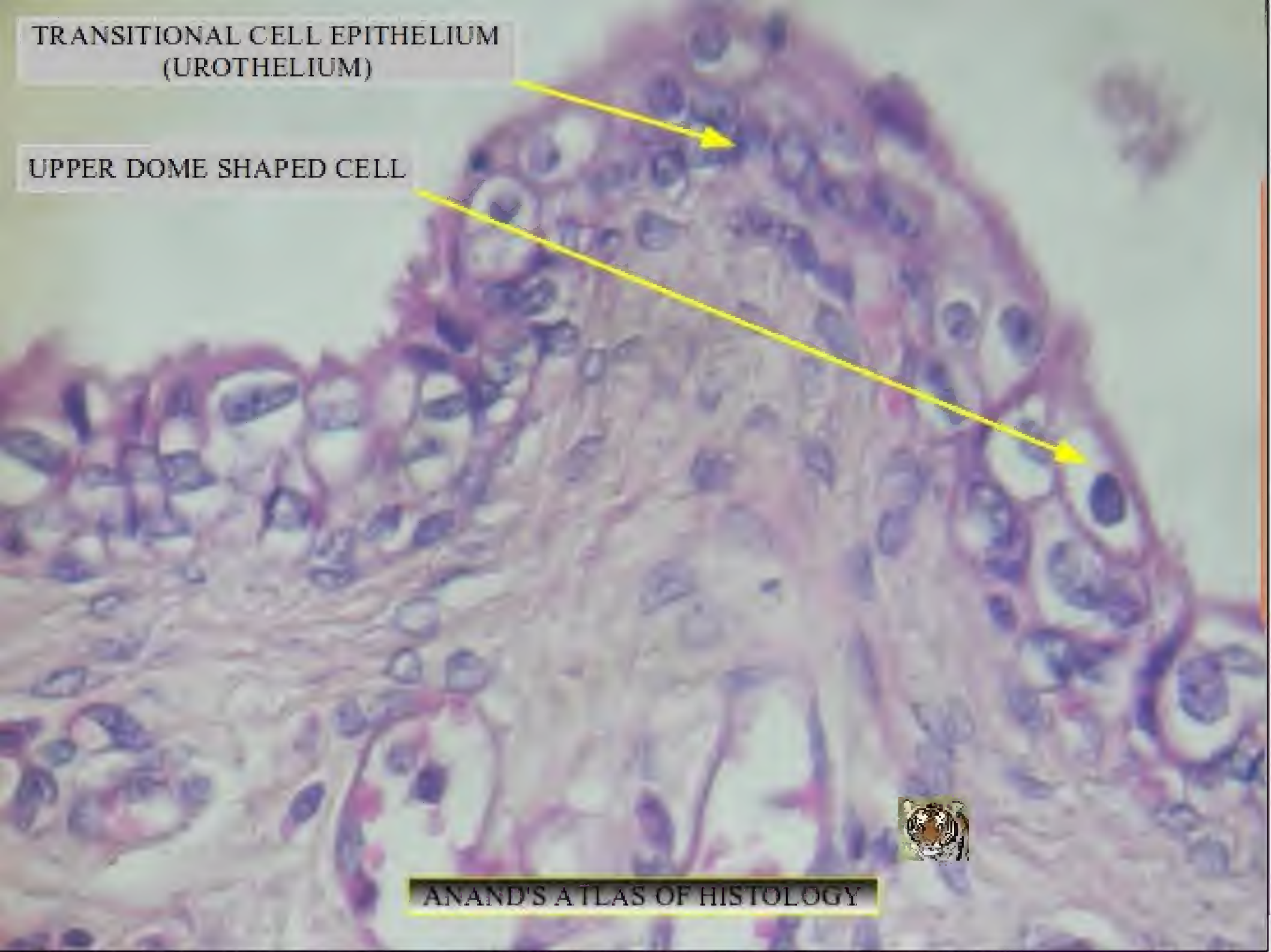
MUCOSA



ANAND'S ATLAS OF HISTOLOGY

TRANSITIONAL CELL EPITHELIUM  
(UROTHELIUM)

UPPER DOME SHAPED CELL





# URINARY BLADDER

## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS
2. MUCOSA IS LINED BY TRANSITIONAL CELL EPITHELIUM
3. MUSCULAR COAT IS VERY THICK AND IS THREE LAYERED, INNER AND OUTER LONGITUDINAL AND MIDDLE CIRCULAR LAYERS



# REPRODUCTIVE SYSTEM – MALE

## LIST OF COLOUR PLATES

TESTIS  
EPIDIDYMIS  
VAS DEFERENS  
PROSTATE GLAND  
SEMINAL VESICLE

# TESTIS

CUT SECTIONS OF  
SEMINIFEROUS TUBULES

SPERMS AT VARIOUS  
STAGES OF MATURATION



ANAND'S ATLAS OF HISTOLOGY



LUMEN

SERTOLI CELL

SPERMATOGONIA

SPERMS AT VARIOUS STAGES  
OF MATURATION



ANAND'S ATLAS OF HISTOLOGY

# TESTIS

## POINTS FOR IDENTIFICATION

1. CUT SECTIONS OF SEMINIFEROUS TUBULES ARE SEEN
2. SPERMS AT VARIOUS STAGES OF MATURATION CAN BE SEEN IN THE LUMEN
3. SERTOLI CELLS WHICH PROVIDE NOURISHMENT TO DEVELOPING SPERM IS ALSO SEEN

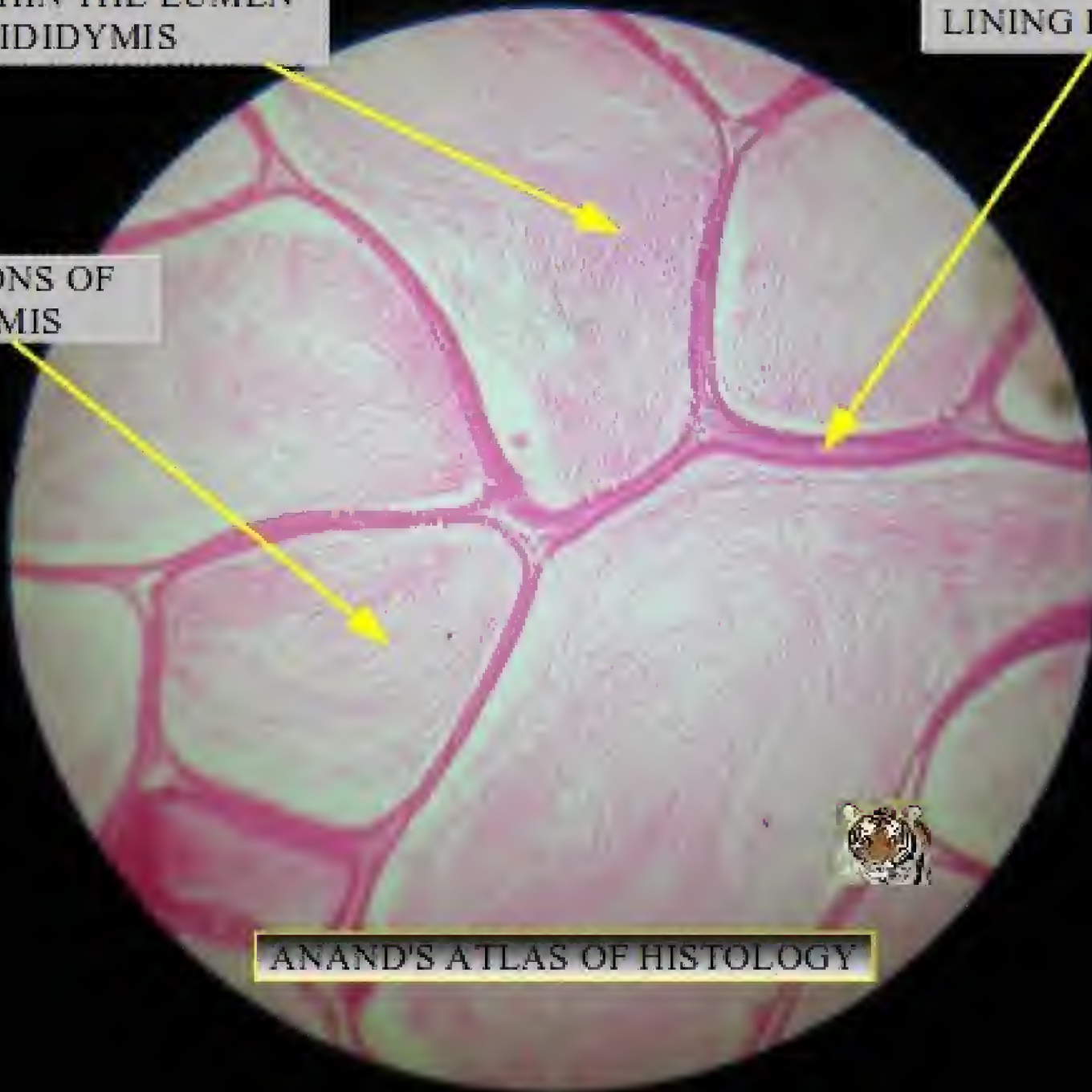
# EPIDIDYMIS



SPERMS WITHIN THE LUMEN  
OF EPIDIDYMIS

LINING EPITHELIUM

CUT SECTIONS OF  
EPIDIDYMIS

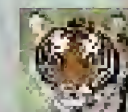


ANAND'S ATLAS OF HISTOLOGY

STEREOCILIA

PSEUDOSTRATIFIED  
COLUMNAR EPITHELIUM

SPERMS





# EPIDIDYMIS

## POINTS FOR IDENTIFICATION

1. CUT SECTIONS OF EPIDIDYMIS ARE SEEN
2. SPERMS CAN BE SEEN IN THE LUMEN
3. LINING EPITHELIUM IS PSEUDOSTRATIFIED COLUMNAR WITH APICAL MICROVILLI TERMED AS STEREOCILIA



# VAS DEFERENS

ANAND'S ATLAS OF HISTOLOGY

LUMEN

MUCOSA

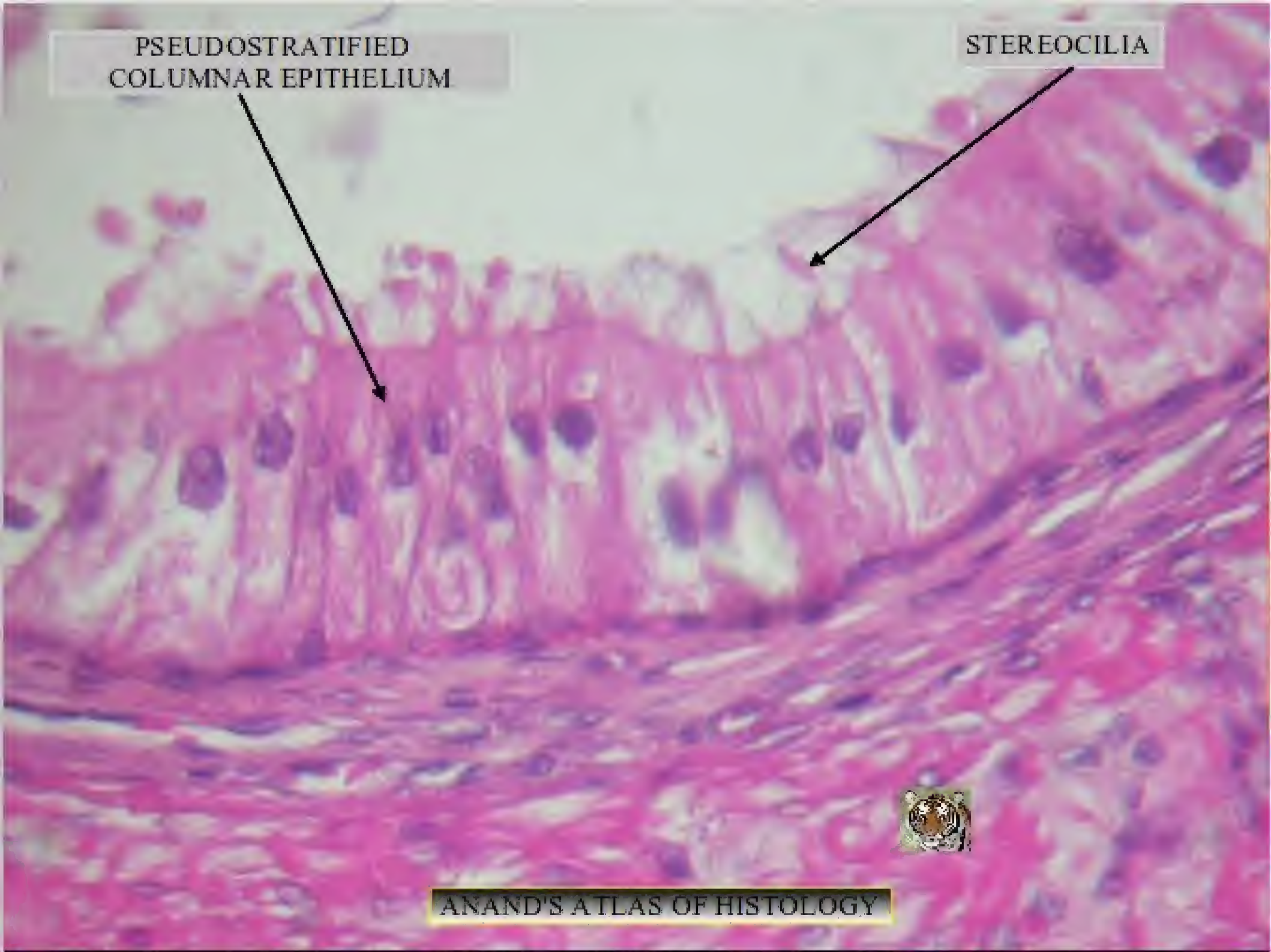
MUSCULAR COAT



ANAND'S ATLAS OF HISTOLOGY

PSEUDOSTRATIFIED  
COLUMNAR EPITHELIUM

STEREOCILIA





# VAS DEFERENS

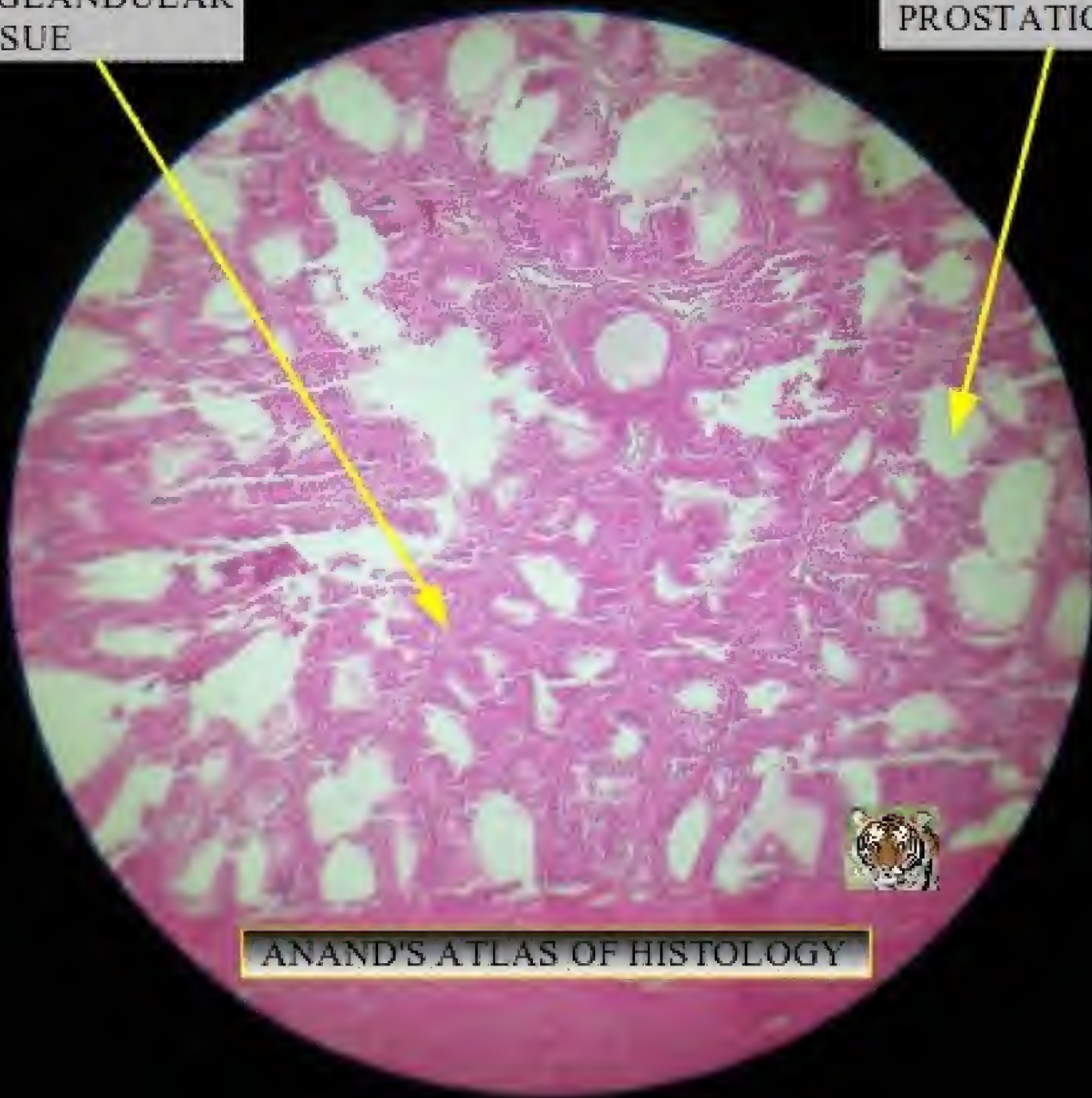
## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS
2. LINED BY PSEUDOSTRATIFIED COLUMNAR EPITHELIUM WITH STEREOCILIA
3. MUSCULAR COAT IS THICK

# PROSTATE GLAND

PROSTATIC GLANDULAR  
TISSUE

PROSTATIC FOLLICLE



ANAND'S ATLAS OF HISTOLOGY

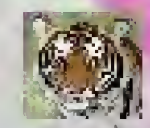


PSEUDOSTRATIFIED EPITHELIUM

MUSCULAR STROMA

COLLOID AMYLOID BODIES

ANAND'S ATLAS OF HISTOLOGY



# PROSTATE GLAND

## POINTS FOR IDENTIFICATION

1. PROSTATIC FOLLICLES ARE SEEN IN GLANDULAR TISSUE
2. FOLLICLES ARE EMBEDDED IN A FIBROMUSCULAR STROMA
3. AMYLOID MATERIAL IS SEEN WITHIN THE FOLLICLE
4. FOLLICLE IS LAYERED BY PSEUDOSTRATIFIED EPITHELIUM OCCASIONALLY EPITHELIUM CAN BE BILAYERED

# SEMINAL VESICLE



DIVERTICULAE

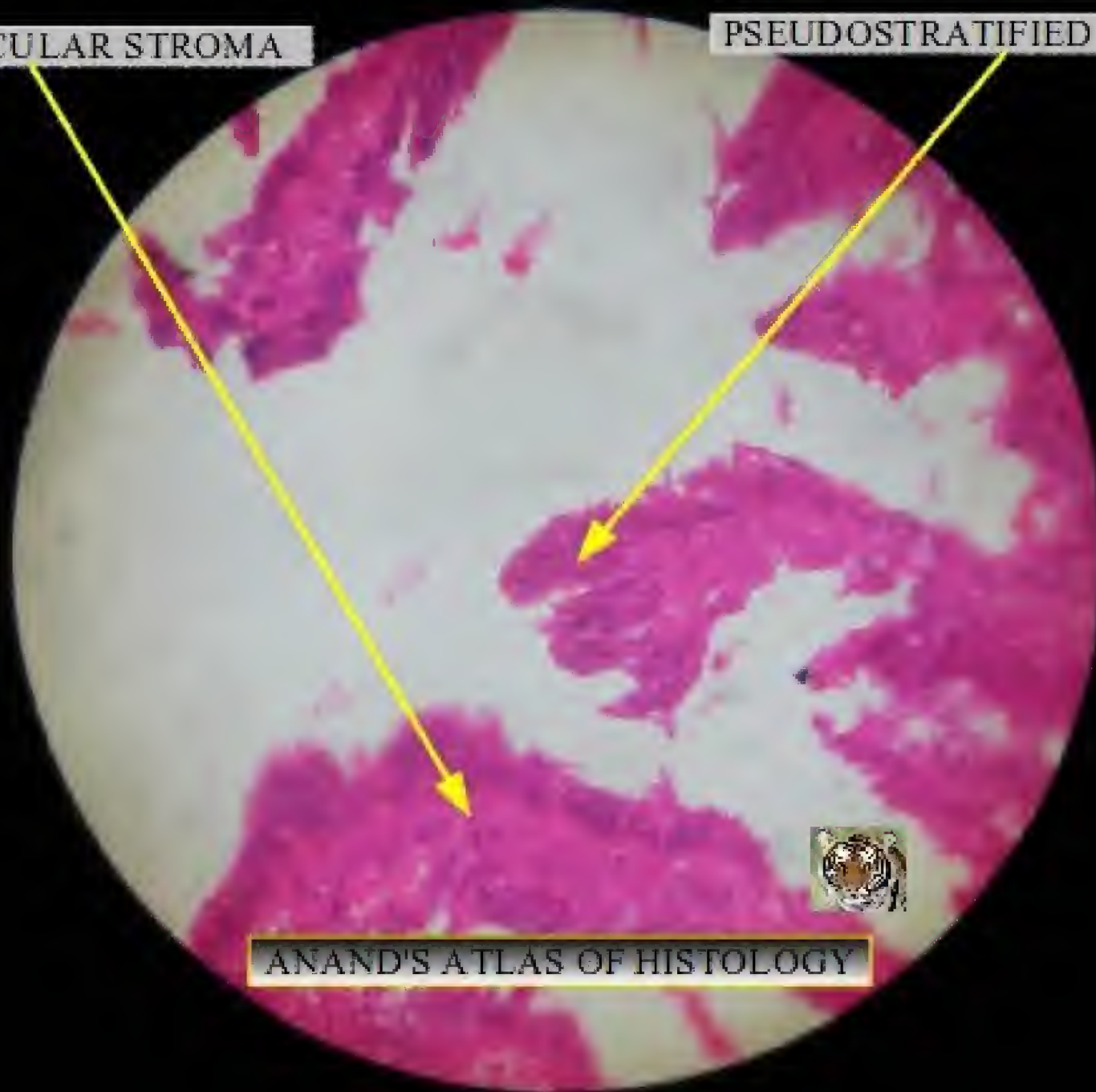
LUMEN



ANAND'S ATLAS OF HISTOLOGY

FIBRO MUSCULAR STROMA

PSEUDOSTRATIFIED EPITHELIUM



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# SEMINAL VESICLE

## POINTS FOR IDENTIFICATION

1. TUBULAR APPEARANCE WITH PRESENCE OF DIVERTICULAE
2. DIVERTICULAE ARE LINED BY PSEUDOSTRATIFIED EPITHELIUM
3. PRESENCE OF LUMEN



# REPRODUCTIVE SYSTEM – FEMALE

## LIST OF COLOUR PLATES

UTERUS

FALLOPIAN TUBE

OVARY

MAMMARY GLAND

PLACENTA

# UTERUS

PERIMETRIUM

ENDOMETRIUM

MYOMETRIUM

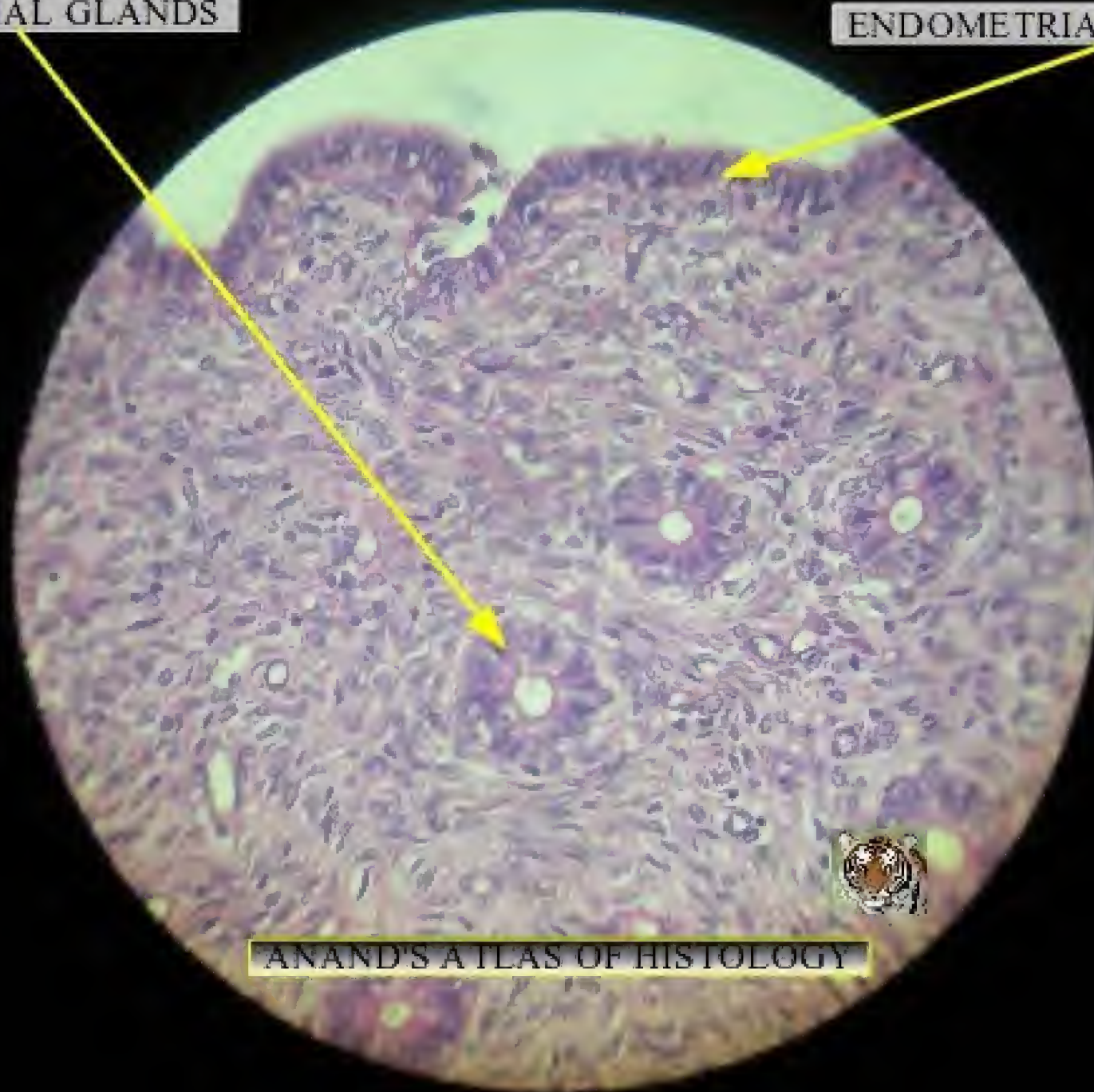


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ENDOMETRIAL GLANDS

ENDOMETRIAL EPITHELIUM



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# UTERUS

## POINTS FOR IDENTIFICATION

1. UTERINE WALL IS MADE OF THREE LAYERS FROM INSIDE TO OUTSIDE ENDOMETRIUM, MYOMETRIUM AND PERIMETRIUM
2. PRESENCE OF UTERINE GLANDS IN ENDOMETRIUM
3. ENDOMETRIAL EPITHELIAL LINING IS COLUMNAR EPITHELIUM

# FALLOPIAN TUBE (UTERINE TUBE)



MUCOSA

LUMEN

MUSCULAR COAT



CILIATED COLUMNAR EPITHELIUM

PEG CELLS (SECRETORY CELLS)

CILIATED CELLS





# FALLOPIAN TUBE

## POINTS FOR IDENTIFICATION

1. MUCOSA IS THROWN INTO FOLDS  
AND IS LINED BY CILIATED  
COLUMNAR EPITHELIUM
2. SECRETORY CELLS (PEG CELLS)  
USUALLY PROJECT IN THE LUMEN



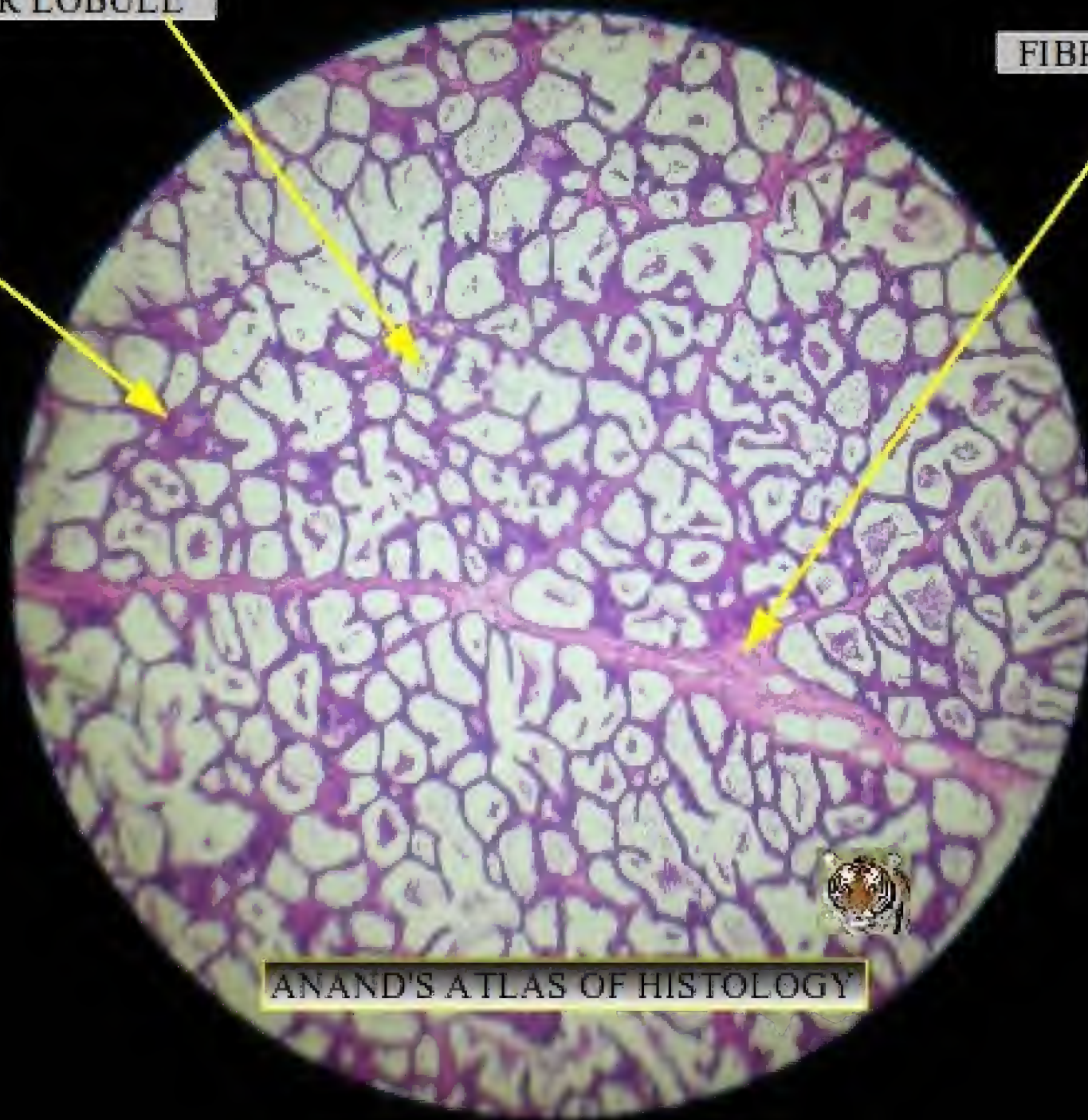
# MAMMARY GLAND

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GLANDULAR LOBULE

FIBROUS SEPTA

DUCT



ANAND'S ATLAS OF HISTOLOGY



GLANDULAR LOBULE

MYOEPIHELIAL CELL

DUCT





# MAMMARY GLAND

## POINTS FOR IDENTIFICATION

1. CUT SECTION SHOWS GLANDULAR LOBULES
2. GLANDS ARE OF RACEMOSE TYPE
3. MYOEPIHELIAL CELLS ARE SEEN AT THE BASE OF DUCTS
4. SOME LARGER DUCTS ARE BILAYERED

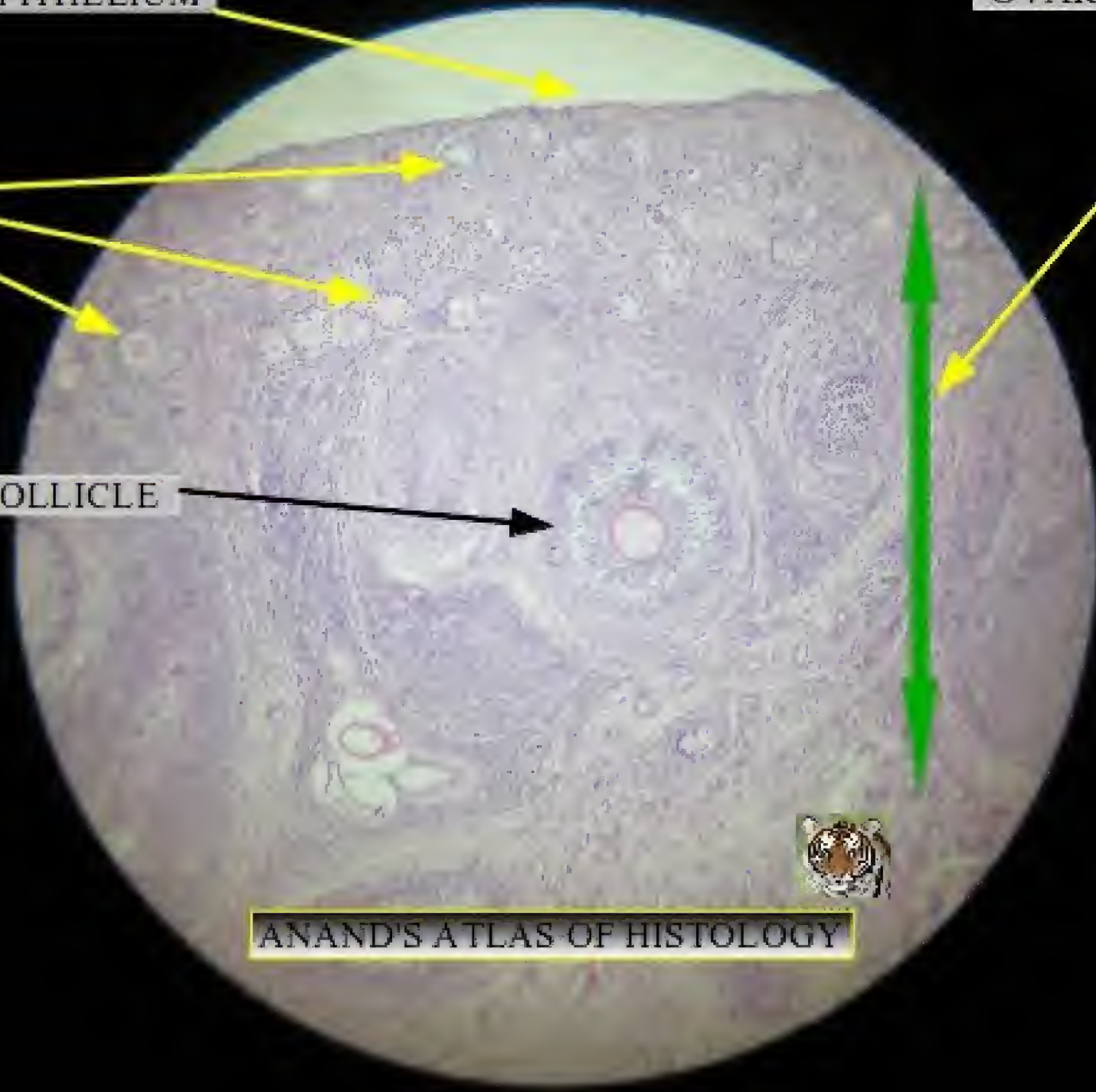
# OVARY

GERMINAL EPITHELIUM

OVARIAN CORTEX

OOCYTES

GRAFFIAN FOLLICLE



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ATRETIC FOLLICLES

OVARIAN MEDULLA

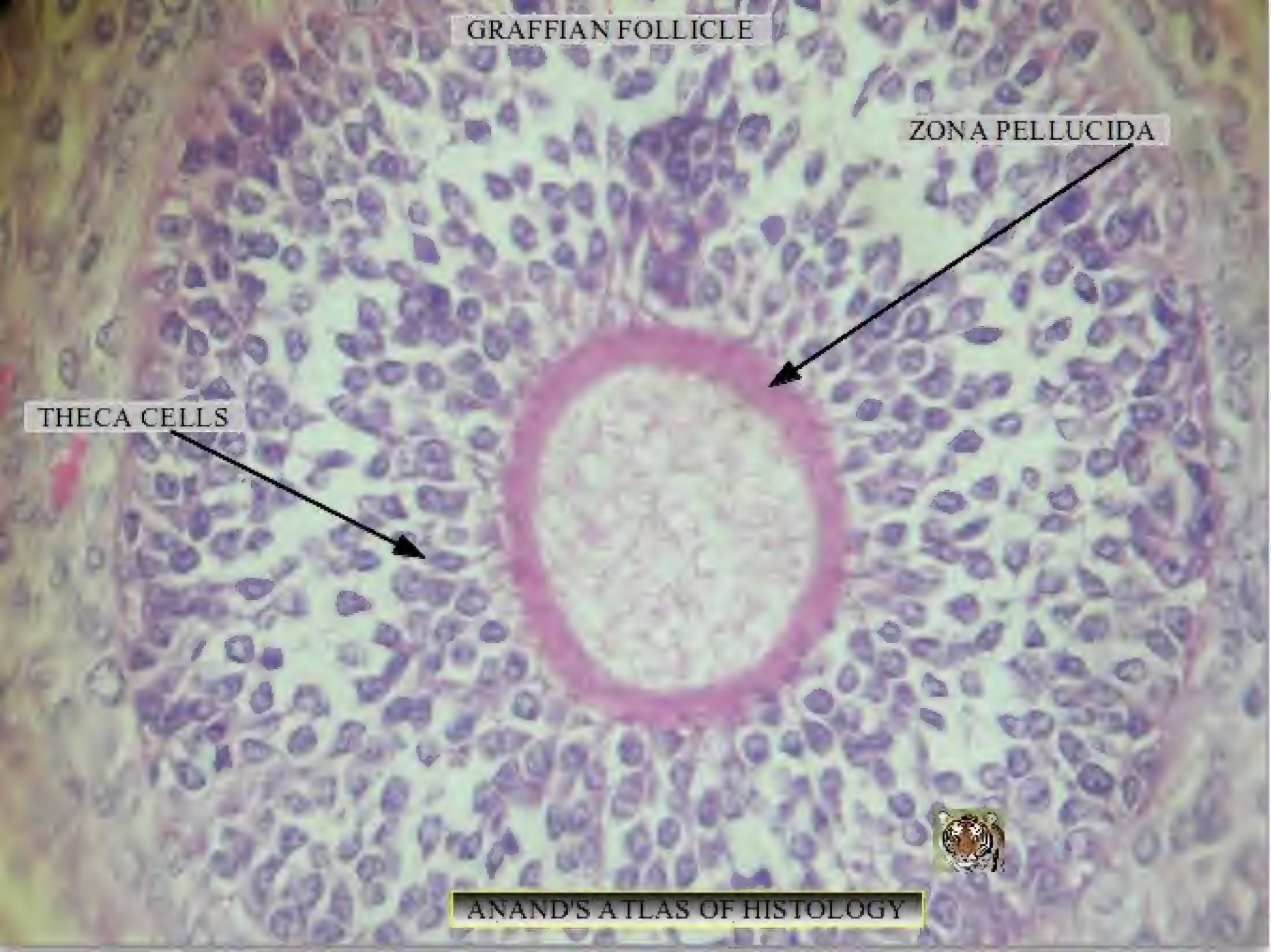


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GRAAFIAN FOLLICLE

ZONA PELLUCIDA

THECA CELLS



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# OVARY

## POINTS FOR IDENTIFICATION

1. PRESENCE OF CORTEX AND MEDULLA
2. OOCYTES ARE SEEN IN VARIOUS STAGES OF MATURATION
3. GRAFFIAN FOLLICLE IS SEEN
4. ATRETIC FOLLICLES ARE SEEN IN THE OVARIAN MEDULLA



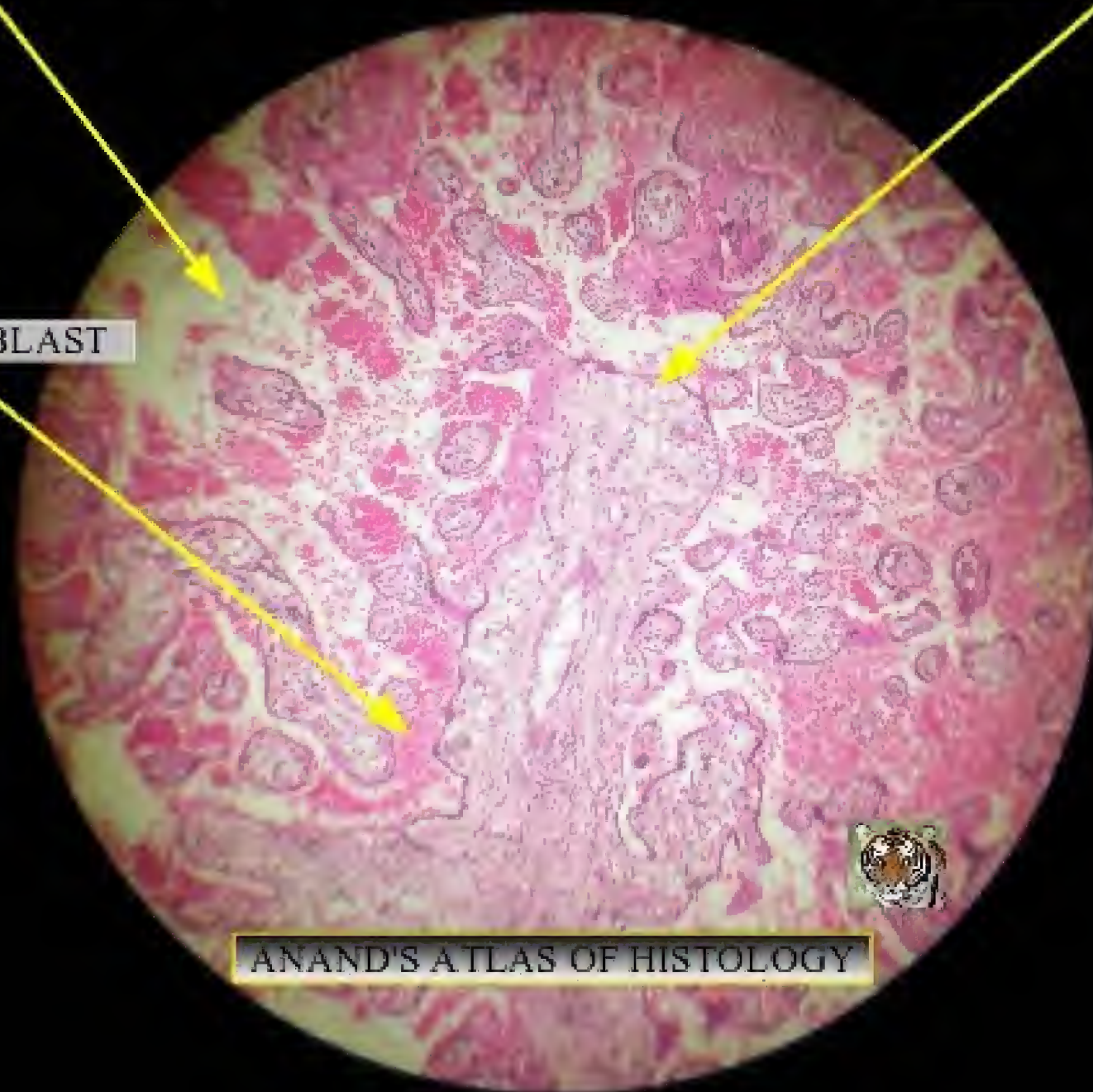
# PLACENTA

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INTER VILLOUS SPACES

VILLUS

CYTOTROPHOBLAST



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SYNCYTOTROPHOBLAST

CYTOTROPHOBLAST

INTERVILLOUS SPACES

HOFBAUER CELL





# PLACENTA

## POINTS FOR IDENTIFICATION

1. PRESENCE OF VILLI
2. CYTOTROPHOBLASTS AND SYNCYTIOTROPHOBLASTS ARE SEEN
3. INTERVILLOUS SPACES ARE SEEN

# ENDOCRINE SYSTEM

## LIST OF COLOUR PLATES

THYROID GLAND  
PARATHYROID GLAND  
PITUITARY GLAND  
ADRENAL GLAND

# THYROID GLAND

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THYROID FOLLICLES

COLLOID



FOLLICLE LINED BY SIMPLE CUBOIDAL EPITHELIUM

COLLOID

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# THYROID GLAND

## POINTS FOR IDENTIFICATION

1. CUT SECTION OF THYROID GLAND SHOWS THYROID FOLLICLES
2. FOLLICULAR CAVITY CONTAINS COLLOID MATERIAL
3. LINING EPITHELIUM OF FOLLICLE IS SIMPLE CUBOIDAL WHEN THERE IS MODERATE AMOUNT OF COLLOID



# PARATHYROID GLAND

PARATHYROID GLAND

THYROID  
GLAND



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CHIEF CELLS

OXYPHIL CELLS





# PARATHYROID GLAND

## POINTS FOR IDENTIFICATION

1. CUT SECTION SHOWS CHIEF CELLS AND OXYPHIL CELLS WHICH ARE ARRANGED IN CORDS
2. CHIEF CELLS ARE SMALL ROUNDED CELLS WITH VESICULAR NUCLEI
3. OXYPHIL CELLS ARE LARGE AND POLYHEDRAL

# PITUITARY GLAND

PARS POSTERIOR  
(NEUROHYPOPHYSIS)

PARS ANTERIOR (ADENOHYPOPHYSIS)

PARS INTERMEDIA  
(RATHKE'S CLEFT)



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PARS ANTERIOR (ADENOHYPOPHYSIS)

CHROMOPHIL  
(BASOPHIL)

CHROMOPHIL  
(ACIDOPHIL)

SINUSOID

CHROMOPHOBES





PARS POSTERIOR  
(NEUROHYPOPHYSIS)

UNMYELINATED NERVE FIBRES

PITUICYTES



# PITUITARY GLAND

## POINTS FOR IDENTIFICATION

1. CUT SECTION SHOWS PARS ANTERIOR, PARS POSTERIOR AND PARS INTERMEDIA
2. PARS ANTERIOR SHOWS CHROMOPHOBS AND CHROMOPHILS
3. PARS POSTERIOR SHOWS UNMYELINATED NERVE FIBRES AND PITUICYTES



# ADRENAL GLAND

## (SUPRA RENAL GLAND)

ADRENAL CORTEX

OUTER CAPSULE

ZONA GLOMERULOSA

ZONA FASCICULATA

ANAND'S ATLAS OF HISTOLOGY





ADRENAL CORTEX

ZONA FASCICULATA

ZONA RETICULARIS

ADRENAL MEDULLA

ANAND'S ATLAS OF HISTOLOGY





OUTER CAPSULE

ZONA GLOMERULOSA

SMALL POLYHEDRAL CELLS IN  
ROUNDED CLUSTERS





ADRENAL MEDULLA

CHROMAFFIN CELLS

RETICULAR FIBRES

SINUSOIDS



ANAND'S ATLAS OF HISTOLOGY

# ADRENAL GLAND (SUPRA RENAL)

## POINTS FOR IDENTIFICATION

1. PRESENCE OF CORTEX AND MEDULLA
2. ADRENAL CORTEX IS MADE OF THREE LAYERS – ZONA GLOMERULOSA, ZONA FASCICULATA, ZONA RETICULARIS
3. ZONA GLOMERULOSA IS MADE OF SMALL POLYHEDRAL CELLS IN A ROUNDED CLUSTER
4. ZONA FASCICULATA IS MADE OF COLUMNS OF CELLS SEPARATED BY SINUSOIDS
5. ZONA RETICULARIS CELLS ARE ARRANGED AS ANASTOMOSING CORDS



# ADRENAL GLAND (SUPRA RENAL)

## POINTS FOR IDENTIFICATION

6. ADRENAL MEDULLA IS MADE OF GROUPS OF CHROMAFFIN CELLS EMBEDDED IN A NETWORK OF RETICULAR FIBRES AND SEPARATED BY WIDE SINUSOIDS

# SPECIAL SENSORY ORGANS

## VISION

### LIST OF COLOUR PLATES

CORNEA

RETINA

LACRIMAL GLAND

EYELID

# CORNEA



ANTERIOR EPITHELIUM

CORNEAL STROMA

POSTERIOR ENDOTHELIUM

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STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM

BOWMAN'S MEMBRANE

CORNEAL STROMA MADE UP OF  
REGULARLY ARRANGED COLLAGEN FIBRES



ANAND'S ATLAS OF HISTOLOGY



# CORNEA

## POINTS FOR IDENTIFICATION

1. ANTERIOR EPITHELIUM IS MADE UP OF STRATIFIED SQUAMOUS NON KERATINISED EPITHELIUM
2. CORNEAL STROMA IS MADE OF REGULARLY ARRANGED COLLAGEN FIBRES
3. POSTERIOR ENDOTHELIUM IS SIMPLE SQUAMOUS EPITHELIUM



# RETINA

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LAYER OF RODS AND CONES

LAYER OF OPTIC NERVE FIBRES



PIGMENT CELL LAYER

LAYER OF RODS AND CONES

EXTERNAL NUCLEAR LAYER

EXTERNAL PLEXIFORM LAYER

INTERNAL NUCLEAR LAYER

INTERNAL PLEXIFORM LAYER

GANGLIONIC CELL LAYER

LAYER OF OPTIC NERVE FIBRES

ANAND'S ATLAS OF HISTOLOGY





# RETINA

## POINTS FOR IDENTIFICATION

1. MADE UP OF 10 LAYERS
2. PRESENCE OF LAYER OF RODS AND CONES
3. PRESENCE OF GANGLIONIC CELL LAYER
4. PRESENCE OF LAYER OF OPTIC NERVE FIBRES

# LACRIMAL GLAND

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LOBULES

INTERLOBAR SEPTA

DUCT





LOBULES

SECRETIONS

TUBULOACINAR CELLS



# LACRIMAL GLAND

## POINT FOR IDENTIFICATION

1. CUT SECTION SHOWS LOBULATED GLAND
2. LOBULE SHOWS TUBULOACINAR CELLS
3. PRESENCE OF INTERLOBULAR SEPTA

# EYELID



STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

ORBICULARIS OCULI

GLANDS



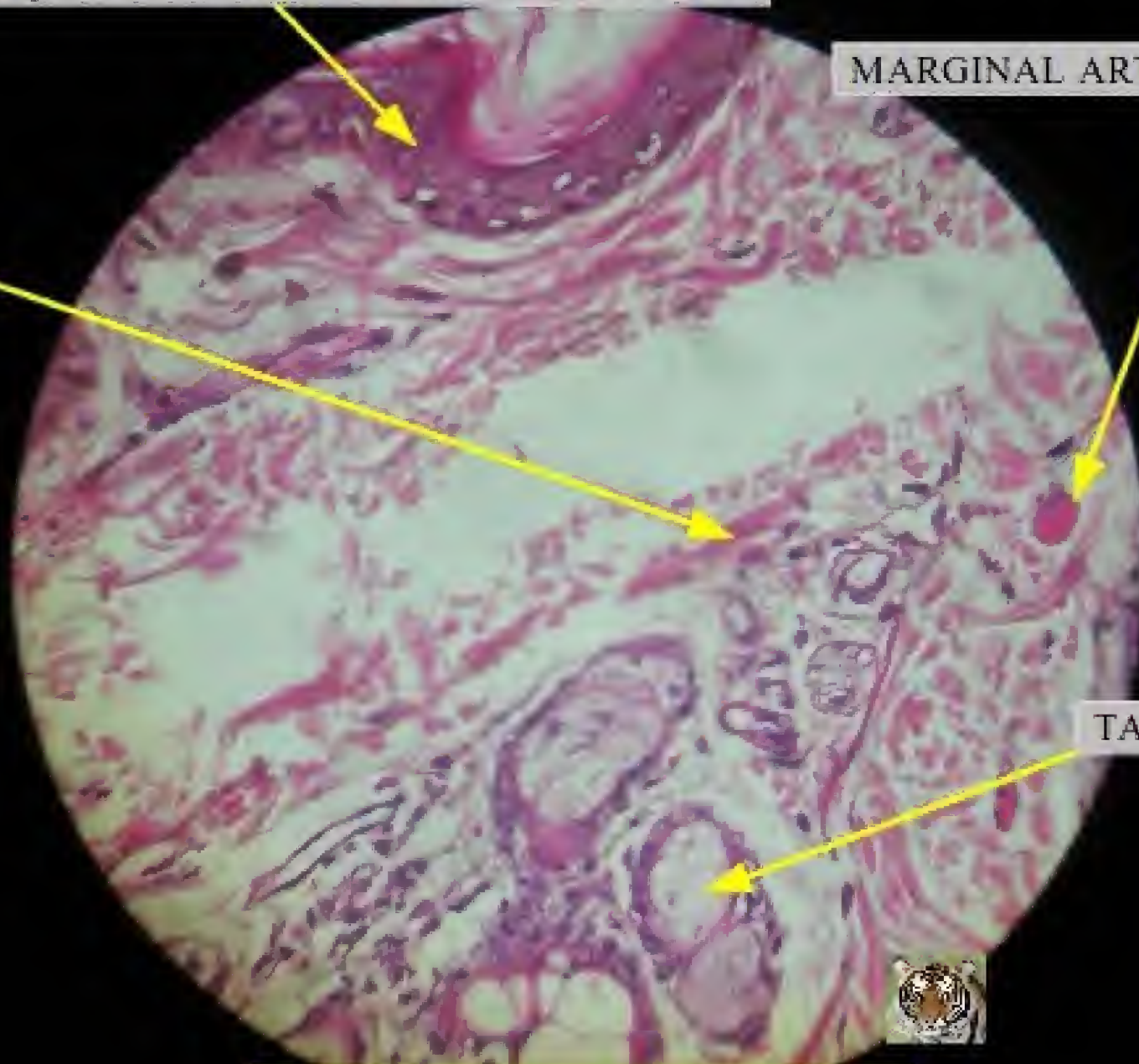


STRATIFIED SQUAMOUS KERATINISED EPITHELIUM

MARGINAL ARTERIAL ARCADE

TARSUS

TARSAL GLANDS



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# EYELID

## POINTS FOR IDENTIFICATION

1. EPITHELIUM IS STRATIFIED  
SQUAMOUS KERATINISED  
EPITHELIUM

2. PRESENCE OF TARSAAL GLANDS

3. PRESENCE OF SKELETAL MUSCLE



# CENTRAL NERVOUS SYSTEM

## LIST OF COLOUR PLATES

CEREBRUM

CEREBELLUM

SPINAL CORD

SENSORY GANGLION

AUTONOMIC GANGLION

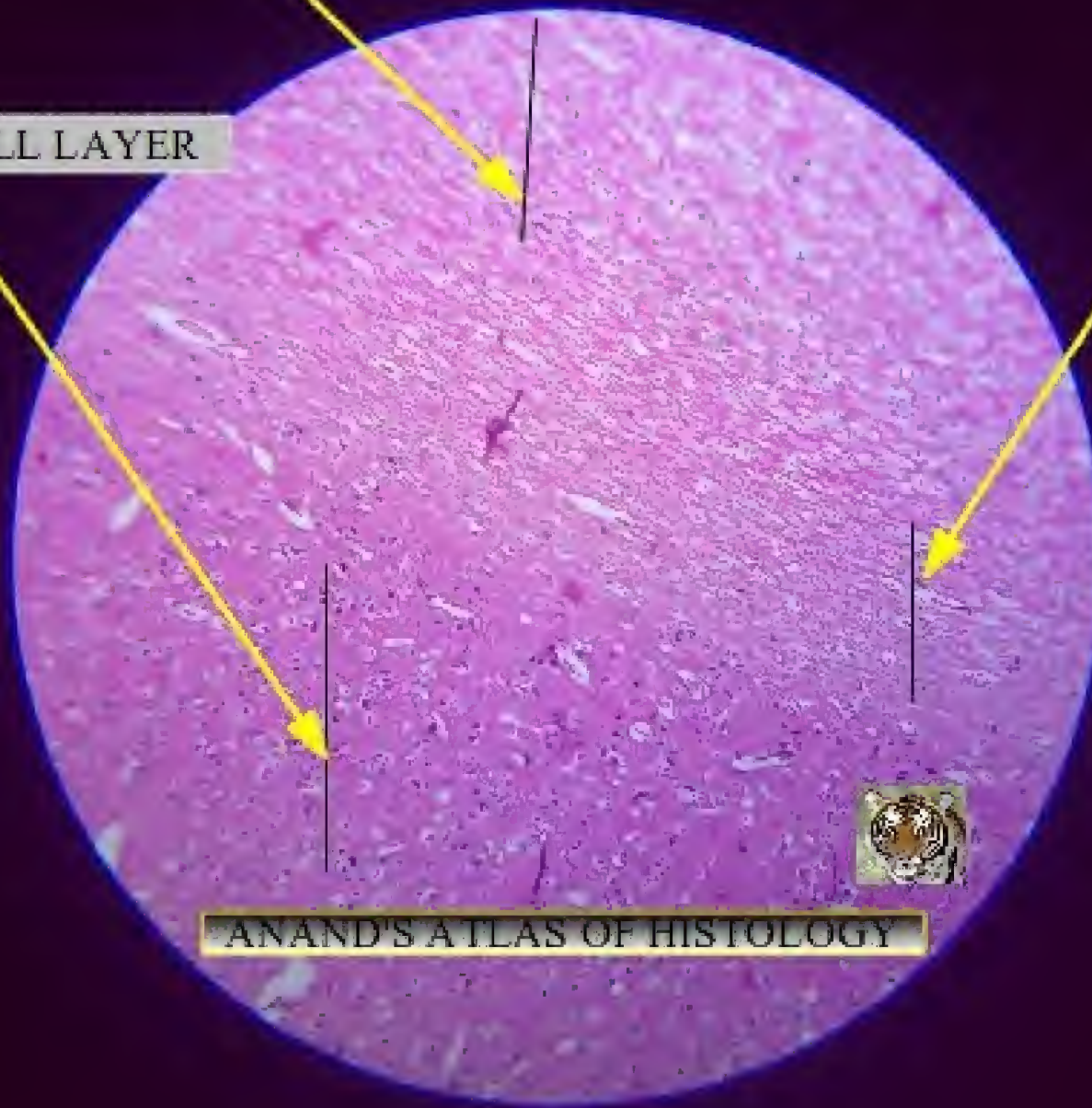
# CEREBRUM

ANAND'S ATLAS OF HISTOLOGY

MOLECULAR CELL LAYER

EXTERNAL GRANULAR LAYER

PYRAMIDAL CELL LAYER

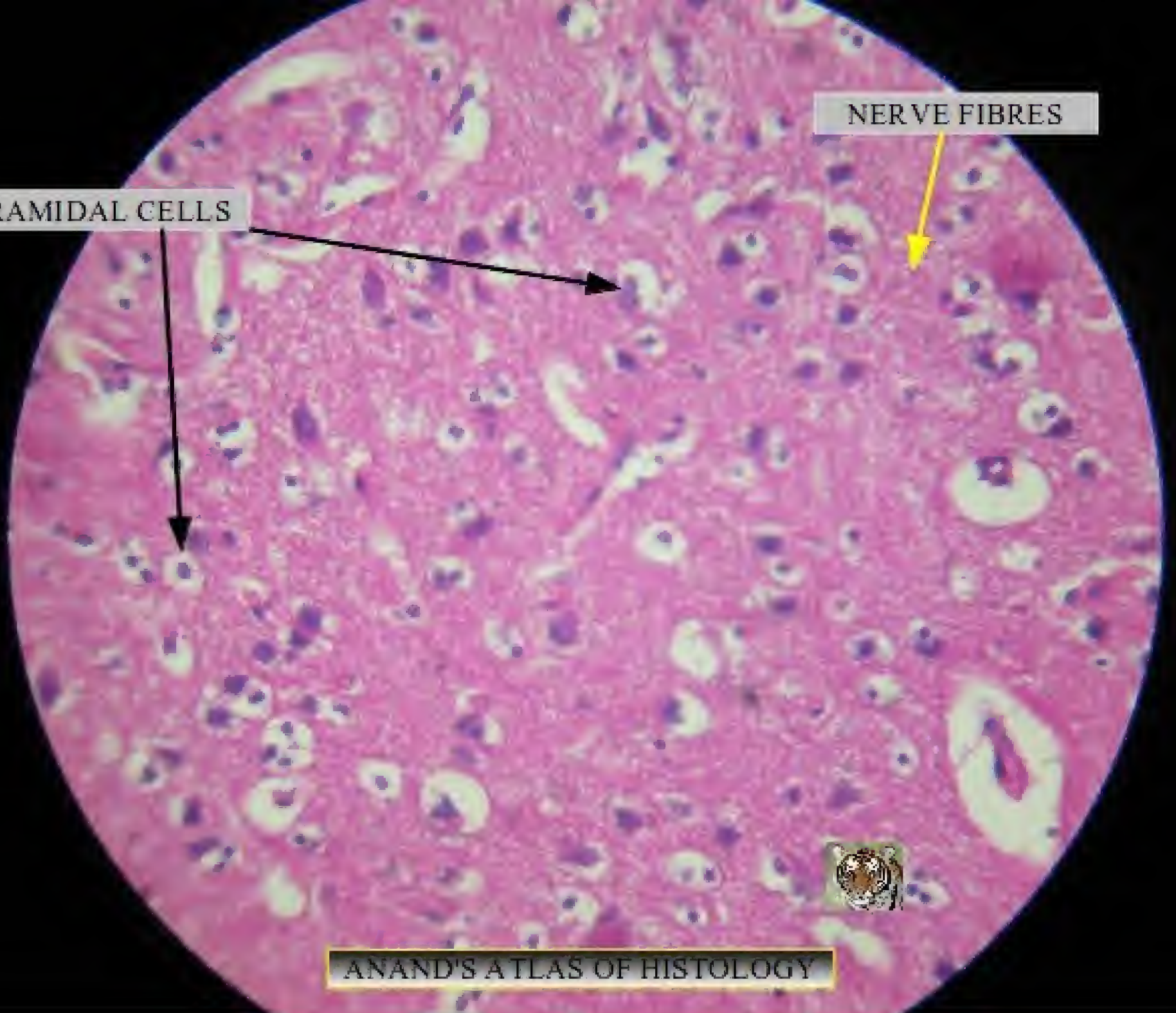


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PYRAMIDAL CELLS

NERVE FIBRES



# CEREBRUM

## POINTS FOR IDENTIFICATION

1. CEREBRAL CORTEX IS MADE UP OF SIX LAYERS
2. GRANULAR LAYER CONSISTS OF CLOSELY PACKED STELLATE CELLS
3. INNER PYRAMIDAL LAYER CONSISTS OF LARGE PYRAMIDAL CELLS (BETZ CELLS)

# CEREBELLUM

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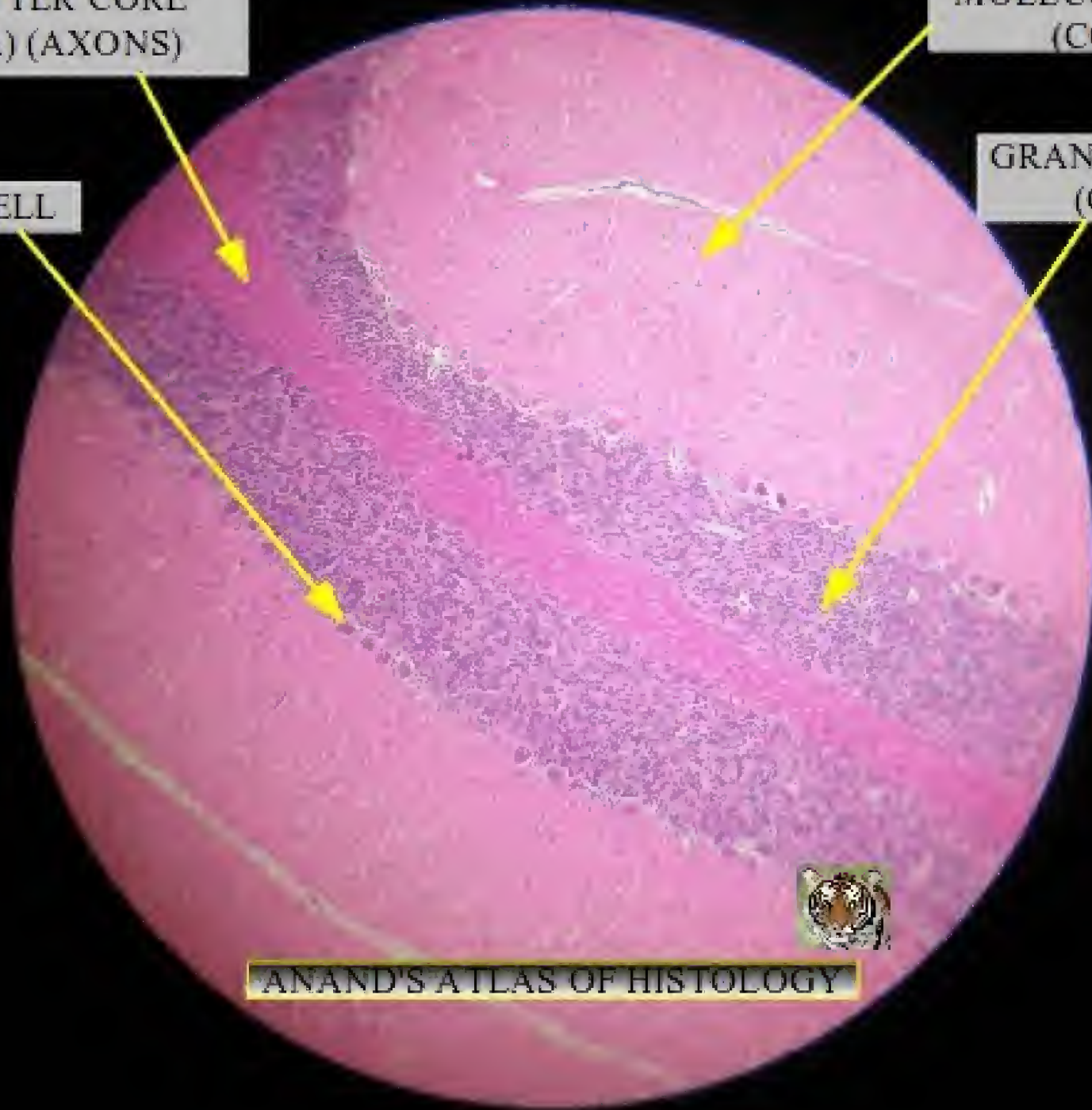


WHITE MATTER CORE  
(MEDULLA) (AXONS)

MOLECULAR LAYER  
(CORTEX)

PURKINJE CELL

GRANULAR LAYER  
(CORTEX)



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MOLECULAR LAYER

GRANULAR LAYER

PURKINJE CELL

WHITE MATTER

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# CEREBELLUM

## POINTS FOR IDENTIFICATION

1. MADE UP OF OUTER GREY MATTER AND INNER WHITE MATTER
2. GREY MATTER (CORTEX) MADE UP OF THREE LAYERS – MOLECULAR CELL LAYER, PURKINJE CELL LAYER AND GRANULAR CELL LAYER
3. WHITE MATTER (MEDULLA) IS MADE UP OF AXONS



# SPINAL CORD

SPINAL CORD GREY MATTER

POSTERIOR HORN

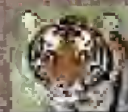
POSTERIOR GREY  
COMMISSURE

ANTERIOR GREY  
COMMISSURE

CENTRAL CANAL

ANTERIOR HORN

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SPINAL CORD WHITE MATTER

POSTERIOR FUNICULUS

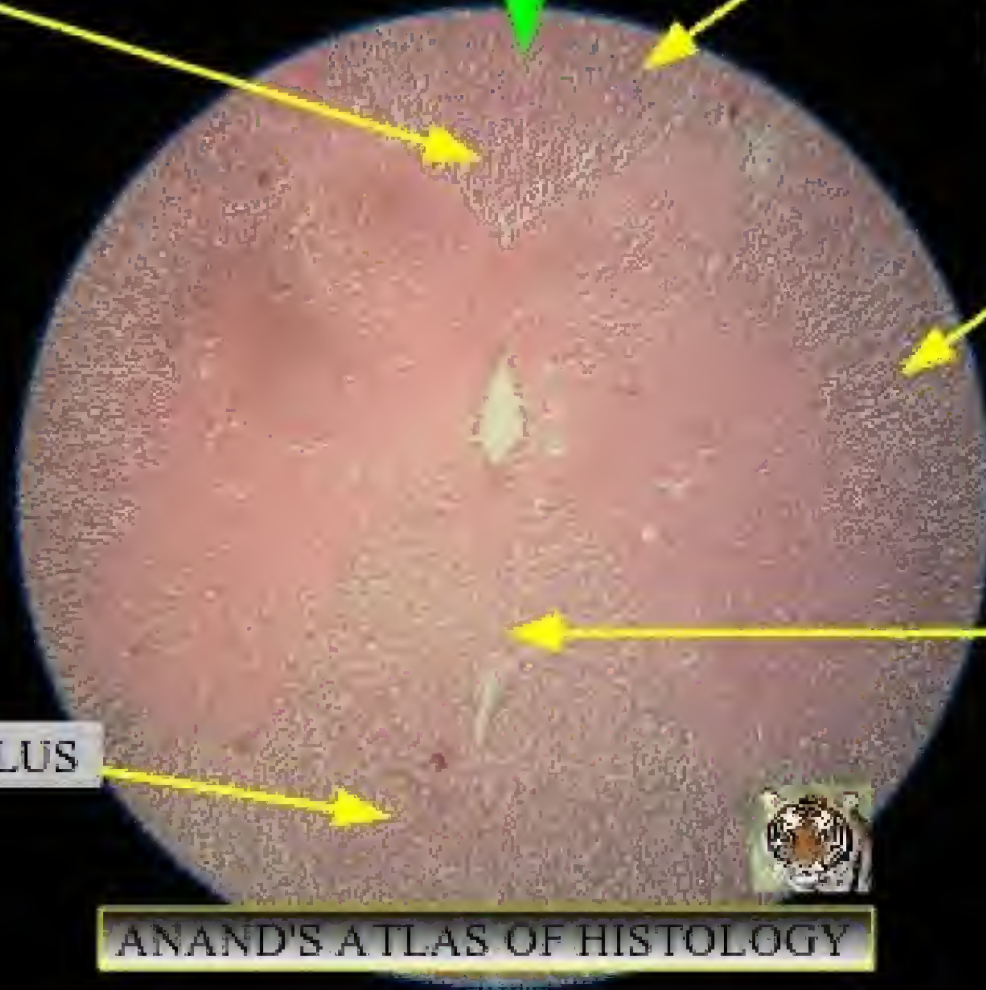
POSTERIOR WHITE  
COMMISSURE

LATERAL FUNICULUS

ANTERIOR WHITE  
COMMISSURE

ANTERIOR FUNICULUS

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# SPINAL CORD

## POINTS FOR IDENTIFICATION

1. PRESENCE OF GREY MATTER AND WHITE MATTER

2. GREY MATTER CONTAINS ANTERIOR AND POSTERIOR HORNS (LATERAL HORN IS PRESENT ONLY IN THE THORACIC SEGMENT)

3. WHITE MATTER CONTAINS ANTERIOR, LATERAL AND POSTERIOR FUNICULI

4. PRESENCE OF CENTRAL CANAL

# SENSORY GANGLION

NEURONAL CELL  
BODIES

MYELINATED  
NERVE FIBRES

CONNECTIVE TISSUE  
CAPSULE

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SATELLITE CELLS

MYELINATED  
NERVE FIBRES

NEURONAL CELL  
BODIES



# SENSORY GANGLION

## POINTS FOR IDENTIFICATION

1. LARGE NEURONS ARE SEEN ARRANGED IN THE PERIPHERY
2. EACH NEURON IS SURROUNDED BY A LAYER OF SATELLITE CELLS
3. CONNECTIVE TISSUE CAPSULE COVERS THE GANGLION

# AUTONOMIC GANGLION

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CONNECTIVE TISSUE  
CAPSULE

NON MYELINATED  
NERVE FIBRES

NEURONAL CELL  
BODIES



NEURONAL CELL  
BODIES

NON MYELINATED  
NERVE FIBRES

SATELLITE CELLS





# AUTONOMIC GANGLION

## POINTS FOR IDENTIFICATION

1. MEDIUM TO SMALL SIZED NEURONS ARE SEEN  
SCATTERED ALL OVER
2. SATELLITE CELLS ARE SEEN ARRANGED ON THE  
PERIPHERY OF THE NEURON BUT ARE NOT WELL  
DEFINED
3. CONNECTIVE TISSUE CAPSULE COVERS THE  
GANGLION



THANK YOU

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1. Herr Linus Torvalds for his magnanimous gesture
2. Messrs Canonical Inc – The Concept, Design and Result of this work was done on Precise Pangolin
3. To all my blood brothers, Past, Present and Future of the 12th Battalion The Assam Regiment (Wangdung) of the Indian Army from where I derive my inner strength
4. My family, friends, teachers and well wishers for their blessings

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# *Anand's Atlas of Histology*

*Web version 1.0*

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